



# Critical Moments Analytics Solution Introduction Guide







# SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this solution, please read this guide and the relevant manuals listed in this guide carefully and pay full attention to safety to handle the product correctly. If the device is used in a manner not specified by the manufacturer, the protection provided by the device may be impaired.

The precautions given in this guide are concerned with this solution only.

In this guide, the safety precautions are classified into two levels: "⚠ WARNING" and "⚠ CAUTION".

 WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
 CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.


Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.


Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this guide and then keep the guide in a safe place for future reference.

This guide does not cover all safety precautions for each product. Please read the manual for each product before use.

[Design Precautions]

 WARNING
<ul style="list-style-type: none"> <li>• For the operating status of each station after a communication failure, refer to the manual of each network. Incorrect output or malfunctions due to a communication failure may result in an accident.</li> <li>• In particular, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program and determine corrective actions to be taken between the external device and the CPU module in case of a communication failure.</li> <li>• When changing data in the programmable controller or controlling the status of the programmable controller during operation from a personal computer, configure an interlock circuit outside the programmable controller system so that the entire system operates safely. Additionally, for online changes from peripheral devices to the PLC CPU, establish procedures for handling communication failures that may occur due to issues such as poor cable connections.</li> <li>• If a communication cable is disconnected, the network may become unstable, resulting in communication failures on multiple stations. Configure an interlock circuit in the program to ensure that the entire system operates safely even if communication fails. Incorrect output or malfunctions due to a communication failure may result in an accident.</li> </ul>


 CAUTION
<ul style="list-style-type: none"> <li>• While settings are being applied, do not perform any operations that forcibly turn off the power of the personal computer running this solution. If the power is forcibly turned off while any settings are being applied, data may become undefined. In such cases, the settings must be configured and applied again. In addition, this may cause malfunctions in the devices used with this solution.</li> </ul>

## [Security Precautions]

 WARNING


- To maintain the security (confidentiality, integrity, and availability) of this product and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

## [Wiring Precautions]

 CAUTION

- Place the cables to be connected to the built-in Ethernet port of the personal computer or the Ethernet adapter in a duct or clamp them. If not, dangling cables may swing or be inadvertently pulled, which can damage the cables or cause malfunctions due to poor connections.
- When disconnecting the cable from the built-in Ethernet port of the personal computer or the Ethernet adapter, do not pull the cable by the cable part. Pulling the cable connected to the built-in Ethernet port of the personal computer or the Ethernet adapter may damage the cables or cause malfunctions due to poor connections.
- Check the interface type and correctly connect the cable. Incorrect wiring (connecting the cable to an incorrect interface) may cause failure of the module and external device.
- Prevent foreign matter such as dust or wire chips from entering the personal computer. Such foreign matter can cause a fire, failure, or malfunction.
- Securely connect communication cables to the built-in Ethernet port of the personal computer or the Ethernet adapter. After connecting them, check for any lifting.
- Individually ground the personal computer with a ground resistance of 100 ohms or less. Failure to do so may result in malfunction.

## [Precautions when using MELSOFT VIMA in China]

 CAUTION

- Some characters defined in GB 18030-2022 cannot be used.

## [Precautions for installation]

- Use only the default folder as the installation folder.

If any operation other than that described above is performed, MELSOFT VIMA may not operate properly. For example, characters are not displayed on MELSOFT VIMA.

## [Precautions for a file saving destination]

- Use only alphanumeric characters for the name of a folder and file specified when a file is saved or opened in MELSOFT VIMA. Observe the same rule when changing a saved file name.

If any other character is used, MELSOFT VIMA may not operate properly. For example, saving processing is canceled.

## CONDITIONS OF USE FOR THE PRODUCT

- (1) This software shall be used under the following conditions;
  - i) that any failure occurred in this software, if any, shall not lead to any serious accident.
  - ii) that the backup and/or fail-safe functions are systematically performed outside the devices in the cases of any failure occurred in this software.
- (2) Mitsubishi Electric assumes no responsibility and liability (including but not limited to, default liability, defect liability, quality assurance responsibility, tort liability, product liability) for the quality, performance, and safety of both this software and products using this software.
- (3) Mitsubishi Electric shall have no responsibility or liability for any problems involving this software and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

## INTRODUCTION

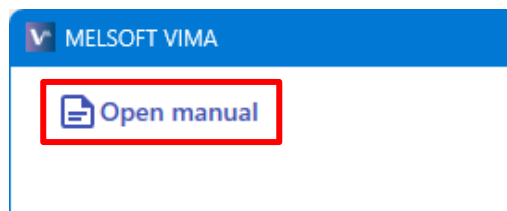
This document is an introduction guide for Critical Moments Analytics Solution.

Follow the procedures described in this document to introduce Critical Moments Analytics Solution.

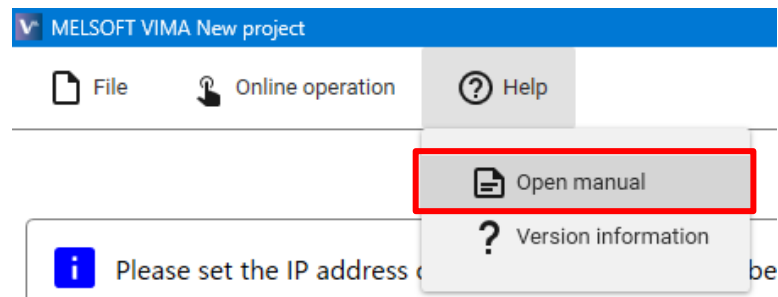
For the operating method after the introduction, refer to the user's manual<sup>\*1</sup> of Critical Moments Analytics Solution.

\*1: The user's manual can be opened by performing either of the following operations in MELSOFT VIMA.

- Click "Open manual" on the top screen.



- Select [Help] → [Open manual] in the menu.



## RELEVANT MANUALS

The following lists the manuals relevant to this solution.

### ■ Mitsubishi Electric Corporation

Manual name [manual number]	Description
Critical Moments Analytics Solution Introduction Guide [BCN-89796-0228] (this guide)	Overview, system configuration, and introduction procedure of Critical Moments Analytics Solution
Critical Moments Analytics Solution User's Manual [BCN-89796-0234]	MELSOFT VIMA, procedures from startup to operation, and troubleshooting of Critical Moments Analytics Solution
GX Works3 Operating Manual [SH-081215ENG]	System configuration, parameter settings, and operation methods for the online function in GX Works3
MELSEC iQ-R Motion Module User's Manual (Startup) [IB-0300406ENG]	Specifications, procedures before operation, system configuration, and wiring of the Motion module
MELSEC iQ-R Motion Module User's Manual (Application) [IB-0300411ENG]	Functions, I/O signals, variables, labels, programming, and troubleshooting of the Motion module
MELSEC iQ-R Motion Module User's Manual (Network) [IB-0300426ENG]	Functions, parameter settings, troubleshooting, and buffer memory of CC-Link IE TSN
Motion Control Setting Function [MCSHELP1252]	System configuration, function description, operation methods, and programming of the motion control setting function
MELSEC MX Controller MX-R Model User's Manual [SH-082641ENG]	Procedures before operation, specifications, devices, memory, functions, parameters, and troubleshooting of the controller

■ ViSCO Technologies Corporation

The latest manuals for products manufactured by ViSCO Technologies Corporation can be downloaded from the website of ViSCO Technologies Corporation.

<https://www.visco-tech.com/english/>

Manual name [manual number]	Description
Flash Light Controller User's Manual MVTFC1-0448-00 [MANTMFC1-EN]	Handling method of the flash light controller
Flash Light Controller MVTFC1-0448-00 Hardware Guide [MANHMFC1-EN]	Product specifications, setting methods, description of each part, connections and settings, and troubleshooting of the flash light controller
High-Brightness LED Light User's Manual HB2-T2612W0-3F / HB2-T5012W0-5F [MANTHB2-EN-1_0-3F04]	Handling method of the high-brightness LED light
High-Brightness LED Light User's Manual [MANTHB2-EN-1_0-IC01]	Handling method of the high-brightness LED light

# TERMS

Unless otherwise specified, this guide uses the following terms.

Term	Description
CC-Link IE TSN	An open network that uses "TSN (Time-Sensitive Networking)", which is an extension of the Ethernet standard, to ensure real-time control and handle information from other open networks simultaneously.
CC-Link IE TSN Class	A group of devices and switching hubs compatible with CC-Link IE TSN, classified according to the functions and performance by the CC-Link Partner Association. For CC-Link IE TSN Class, refer to the CC-Link IE TSN Installation Manual (BAP-C3007ENG-001) published by the CC-Link Partner Association.
Focal length	Distance from the center of the lens to the imaging element.
Global label	A label that is valid for all the program data when multiple program data are created in the project.  There are two types of global labels: module specific labels (module labels), which are automatically generated by GX Works3, and optional labels, which can be created for any specified device.
GX Works3	The product name of the software package for MELSEC programmable controllers.
Imaging data	Data of the camera images collected.
Label	A variable consisting of a specified string used in I/O data or internal processing.
Link device	A device (RX, RY, RWr, or RWw) in a module on CC-Link IE TSN.
Local station	A station that performs cyclic transmission and transient transmission with the master station and other local stations.
Master station	A station that controls the entire network. This station can perform cyclic transmission and transient transmission with all stations. Only one master station can be used in a network.
Motion control station	A device station that exchanges cyclic data through slave labels and motion control.
Multicast mode	A communication mode used to send cyclic data to multiple stations.
Remote station	A station that performs cyclic transmission of I/O signals in bits and I/O data in words. Transient transmission can be performed as well.
TSN control cycle	Communication cycle for the CC-Link IE TSN master station.
TSN control data	Link device data for the master station and device stations of CC-Link IE TSN.
Unicast mode	A communication mode used to send cyclic data to one station.
USB3 Vision	One of the interface standards for industrial cameras.
Working distance	Distance from the subject to the front of the lens.

## GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this guide uses the following generic terms and abbreviations.

Generic term/abbreviation	Description
Control port	A generic term for an imaging control port and lighting control port of the lighting controller.
CPU module	A generic term for MX Controller and RCPU.
Device station	A generic term for a local station and remote station on CC-Link IE TSN.
Engineering tool	A generic term for GX Works3 and MELSOFT VIMA.
High-intensity lighting	An abbreviation for the high-brightness LED light manufactured by ViSCO Technologies Corporation (HB2-T5012W0-5F, HB2-C22X1W0-IC).
Lighting controller	An abbreviation for the flash light controller manufactured by ViSCO Technologies Corporation (MVTFC1-0448-00).
Motion module	A generic term for RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, and RD78GHW modules.
MX Controller	A generic term for MXR300-16, MXR300-32, MXR300-64, MXR500-128, and MXR500-256 controllers.
RWr	An abbreviation for a remote register of the link device. This refers to 16-bit (1-word) data input from a device station to the master station. (Not applicable for some local stations.)
RWw	An abbreviation for a remote register of the link device. This refers to 16-bit (1-word) data output from the master station to a device station. (Not applicable for some local stations.)
RX	An abbreviation for remote input of the link device. This refers to bit data input from a device station to the master station. (Not applicable for some local stations.)
RY	An abbreviation for remote output of the link device. This refers to bit data output from the master station to a device station. (Not applicable for some local stations.)
USB camera	An industrial camera that supports USB3 Vision.

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# 1. OVERVIEW

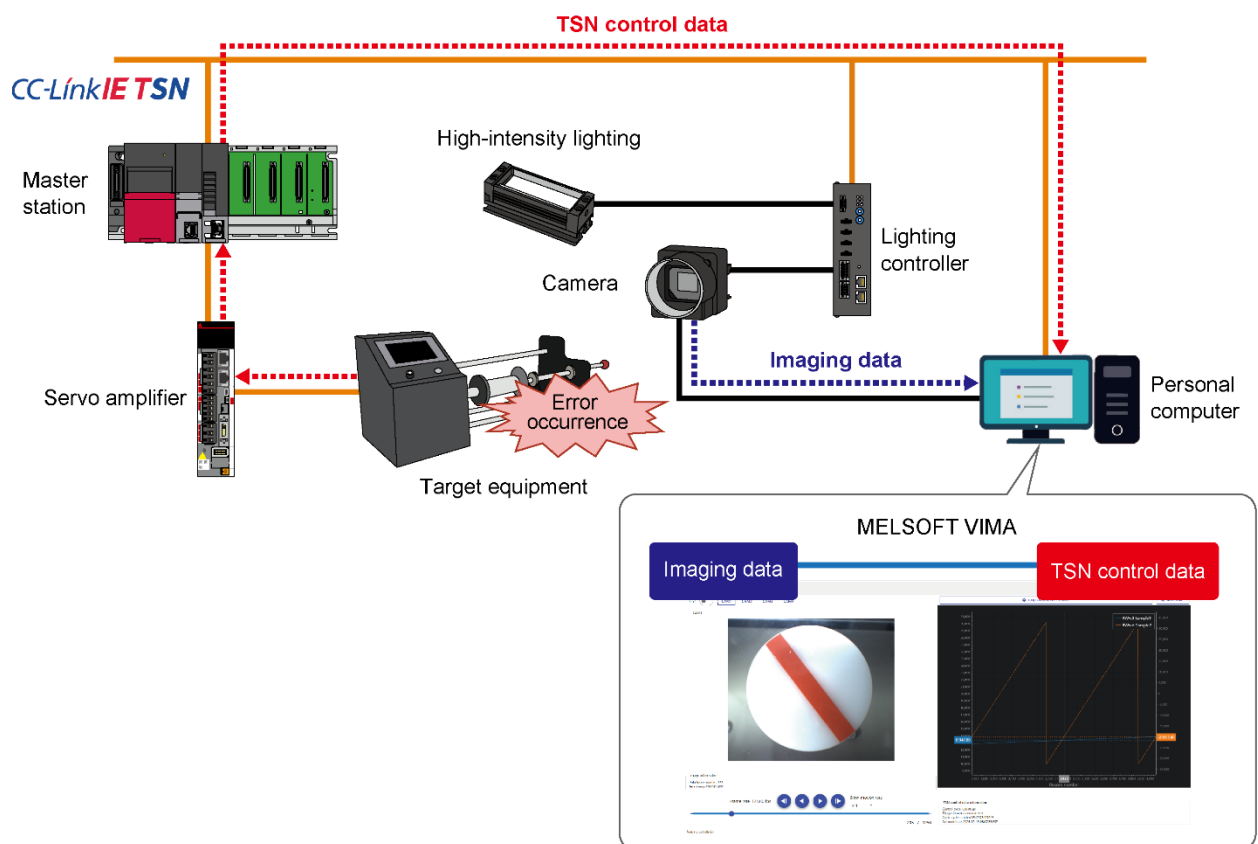
This chapter provides an overview of Critical Moments Analytics Solution.

## 1.1. Overview of Critical Moments Analytics Solution

Critical Moments Analytics Solution supports the resolution of abnormalities and troubles that occur when starting up equipment that performs high-speed and high-intensity operation.

With the analysis support software "MELSOFT VIMA", the imaging data of the target equipment operation captured by cameras can be collected. In addition, the control data of the target equipment can be collected via the CC-Link IE TSN network.

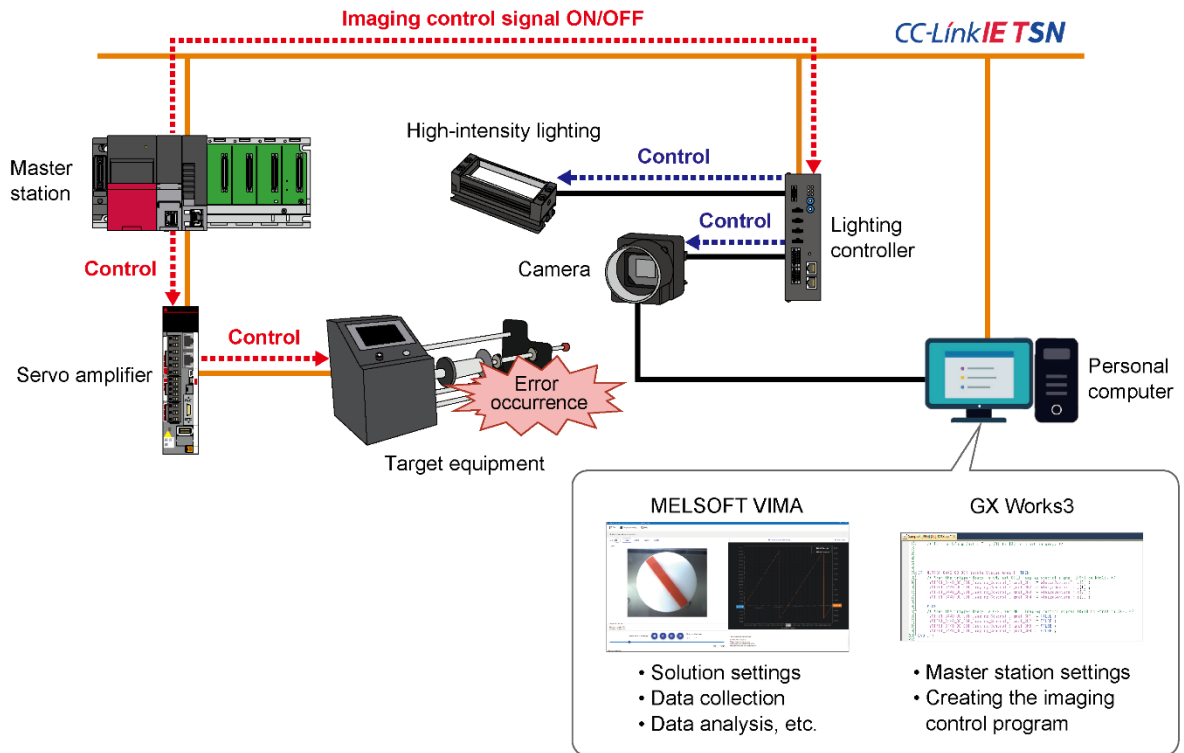
The collected imaging data and the TSN control data can be displayed, played, and digitalized in MELSOFT VIMA. This supports analysis of the abnormalities and troubles.



## 1.2. Configuration of Critical Moments Analytics Solution

The following shows the configuration of this solution.

For details on the components, refer to "3 SYSTEM CONFIGURATION".



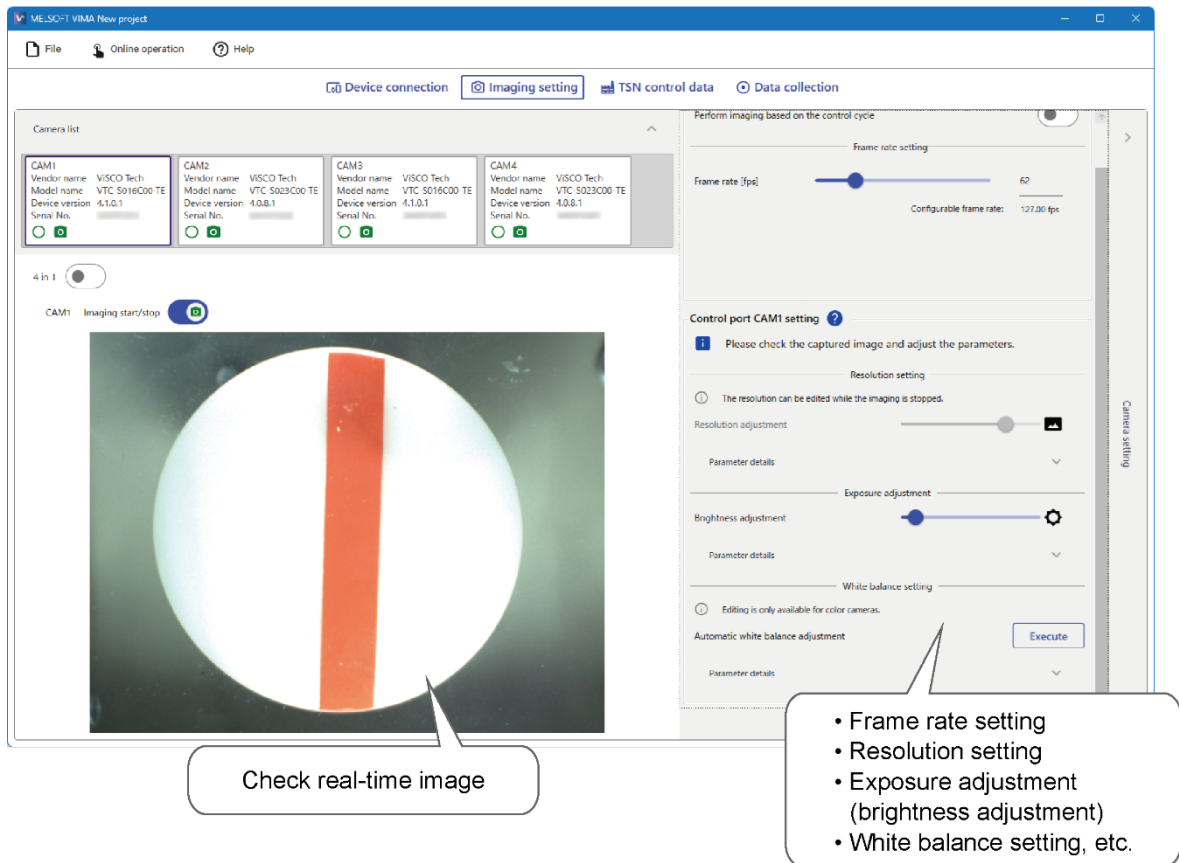
Device/software		Role
Personal computer	MELSOFT VIMA	Configuring the settings of the solution, collecting data, and analyzing data
	GX Works3	<ul style="list-style-type: none"> <li>• Configuring the settings of the Motion module or MELSEC MX Controller</li> <li>• Creating the imaging control program</li> </ul>
Motion module or MELSEC MX Controller		<ul style="list-style-type: none"> <li>• Controlling the target equipment</li> <li>• Turning on/off the imaging control signal of the lighting controller</li> </ul>
Servo amplifier		Controlling the target equipment
Lighting controller		Controlling the camera imaging and lighting
Industrial camera		Imaging of the target equipment
High-intensity lighting		Lighting up the target equipment (Brief bright light is emitted in synchronization with the camera imaging.)

## 1.3. Features of Critical Moments Analytics Solution

### ■ Easy settings in MELSOFT VIMA

Settings of each device such as the camera and lighting that are necessary for imaging can be configured in MELSOFT VIMA.

Because the camera image can be monitored in MELSOFT VIMA in real time, you can configure the imaging environment settings while checking the status of the target equipment.

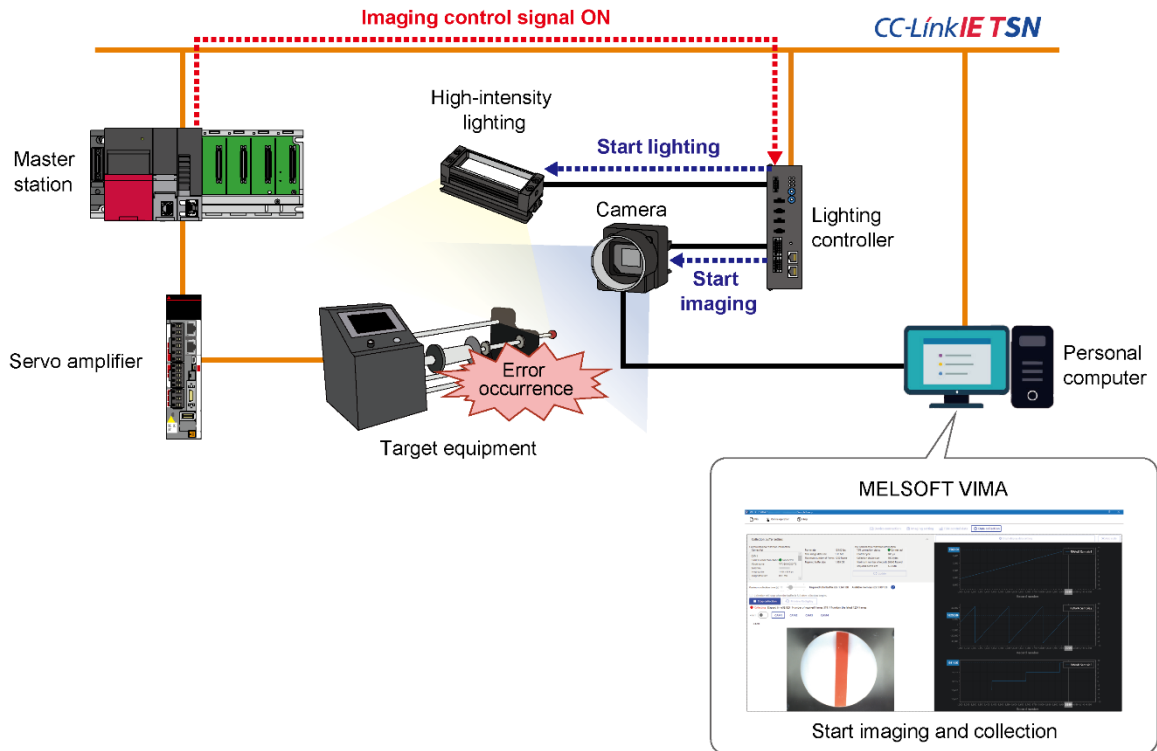


### ■ Collection of high-quality imaging data

This solution allows the highly precise synchronization of the camera imaging and the flash timing of the lighting using the lighting controller. A clear image can be captured even for the equipment that performs high-speed and high-precision operation. High-quality images of operation can be captured without any motion blur even during trouble occurrences, making it easier to check the differences from normal conditions and identify the locations of abnormalities.

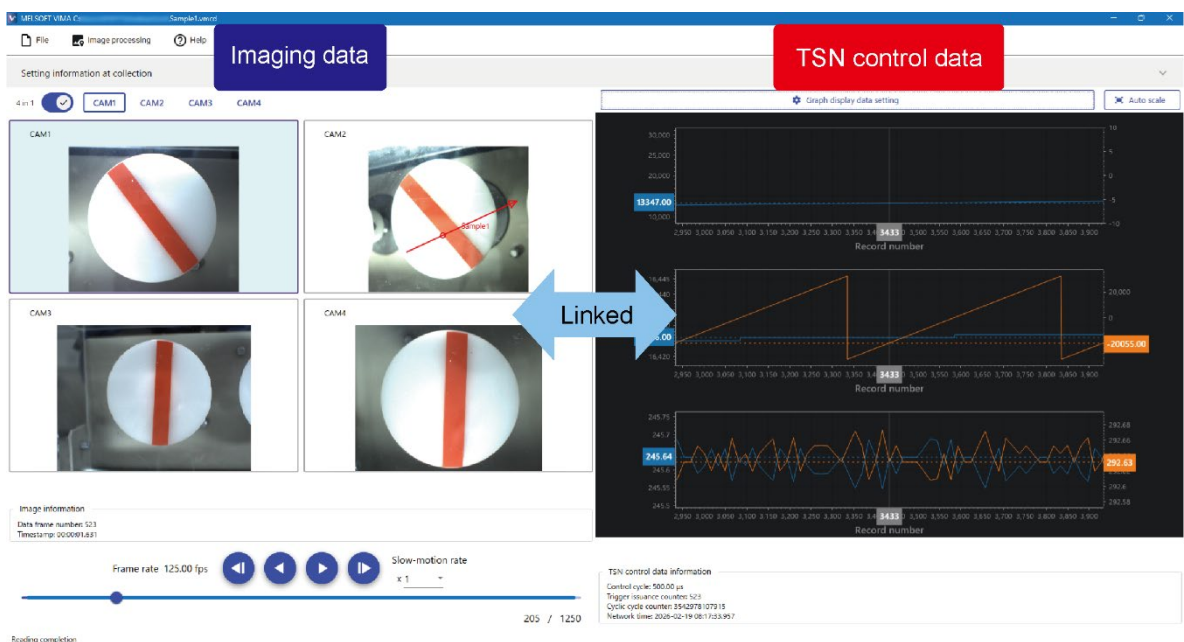
■ Control of imaging timing

Turning on or off the imaging control signal of the lighting controller from the master station (such as the Motion module or MX Controller) enables the control of the imaging timing of the camera and the lighting timing. Because the lighting controller supports the CC-Link IE TSN network synchronous communication, it can operate in synchronization with the cycle of the master station. This allows starting the imaging and turning on the lighting according to the operation timing of the target equipment, and thus the high-precision imaging data can be acquired.



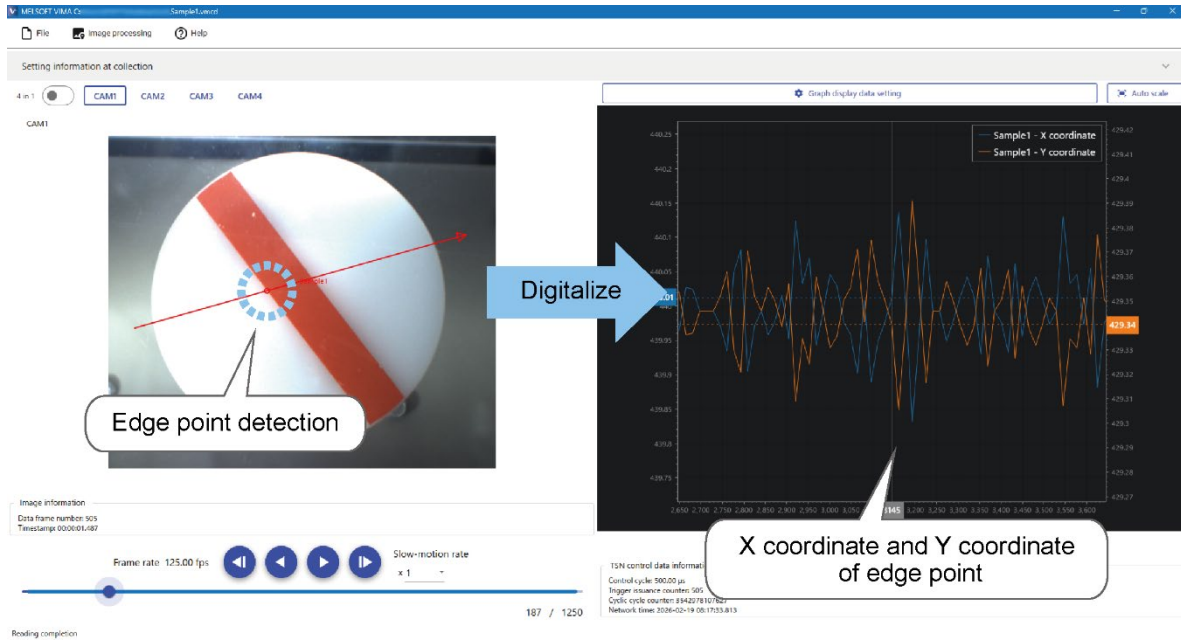
■ Linkage of imaging data and TSN control data

The control data of the target equipment and the imaging data of its operation can be played and checked in conjunction, allowing you to identify the locations and timings of abnormality occurrences from images and graphs. Any type and format can be set for the control data to be displayed.



■ Image measurement of imaging data

Edge points can be detected from the collected imaging data. The detected edge points can be digitalized and displayed in graphs, allowing you to analyze the data quantitatively.



## 2. PERFORMANCE SPECIFICATIONS

This chapter describes the performance specifications of this solution.

### 2.1. Maximum Number of Devices

The following shows the maximum number of devices to be used in this solution.

Device	Maximum number of devices	Description
Camera	4	Up to four cameras can be connected to a single lighting controller.
Lighting controller	1	A single lighting controller can be connected to MELSOFT VIMA.
High-intensity lighting	4 <sup>*1</sup>	Up to four units of high-intensity lighting <sup>*1</sup> can be connected to a single lighting controller.
Motion module or MELSEC MX Controller MX-R model	1	Either a single Motion module or MELSEC MX Controller MX-R model that controls the target equipment can be used.

\*1: When a branch cable is used, two units of lighting can be connected to a lighting control port of 1 CH, thus up to eight units of lighting can be connected.

### 2.2. Performance of TSN Control Data Collection

The following shows the performance of TSN control data collection.

Item		Description	
Channel	Available number of ports	1	
Link device data access	Maximum device points	RX	16384 points (2 K bytes)
		RY	16384 points (2 K bytes)
		RWr	8192 points (16 K bytes)
		RWw	8192 points (16 K bytes)
	Maximum number of stations	<ul style="list-style-type: none"> <li>• For Motion module: 121</li> <li>• For MELSEC MX Controller MX-R model: 253</li> </ul>	
	Minimum communication cycle <sup>*1</sup>	125 μs	

\*1: The minimum communication cycle supported by this solution. The minimum communication cycle of CC-Link IE TSN for each device varies depending on the model. For details, refer to the manual of each device.

## 3. SYSTEM CONFIGURATION

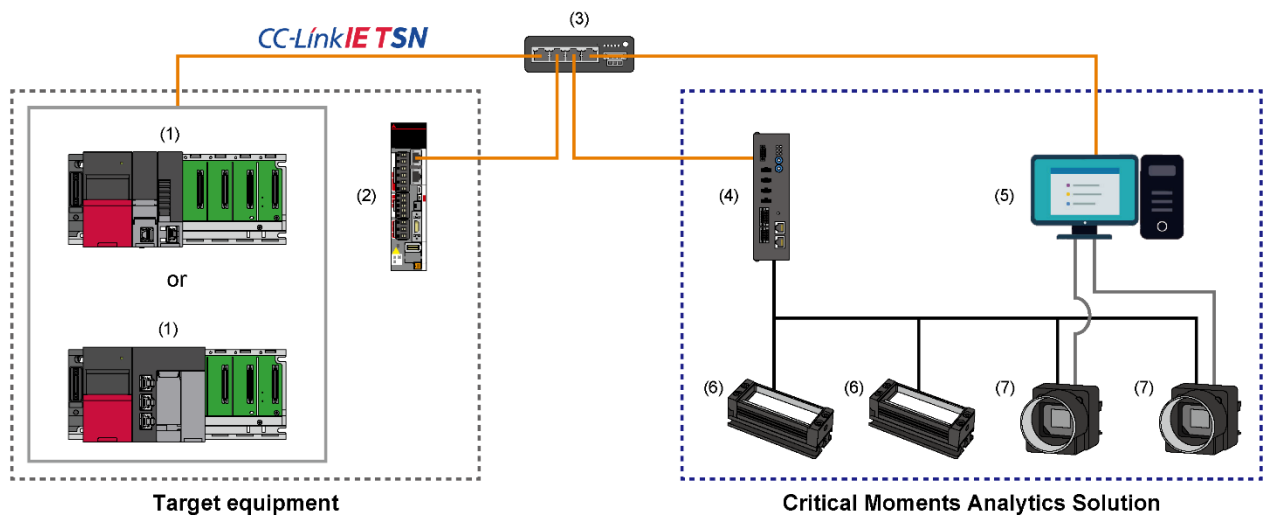
This chapter describes the system configuration of this solution.

### 3.1. Configuration Example

The following shows a system configuration example for this solution.

The system configuration differs depending on the number of devices to be used and the network configuration. This section shows an example for the following case.

- Industrial camera: 2 units
- High-intensity lighting: 2 units
- Network configuration: Star topology



No.	Item	
(1)	MELSEC iQ-R series Motion module/MELSEC MX Controller MX-R model	
(2)	Servo amplifier	
(3)	Switching HUB*1	
(4)	Lighting controller	
(5)	Personal computer*2	GX Works3
		MELSOFT VIMA
(6)	High-intensity lighting	
(7)	Industrial camera (USB camera)	

\*1: It is not required for a line topology. For details of the network configuration, refer to "3.4 Network Configuration".

\*2: GX Works3 and MELSOFT VIMA can be installed and used on different personal computers.

## 3.2. Components

This section describes the details of the components.

### 3.2.1. Programmable controller system

MELSEC iQ-R series Motion modules and MELSEC MX Controller MX-R models can be used.

The following shows the models and firmware versions that can be used as the master station.

Master station	Model	Firmware version <sup>*1</sup>
MELSEC iQ-R series Motion module	RD78G4, RD78G8, RD78G16, RD78G32, RD78G64, RD78GHV, RD78GHW	"26" or later
MELSEC MX Controller MX-R model	MXR300-16, MXR300-32, MXR300-64, MXR500-128, MXR500-256	"05" or later

\*1: For how to check the firmware version, refer to the manual of each model.

### 3.2.2. Servo amplifier

Servo amplifiers that support CC-Link IE TSN can be used.

For details, refer to the manual of each servo amplifier.

### 3.2.3. Lighting controller

The following shows the lighting controller that can be used.

Model	Manufacturer
MVTFC1-0448-00	ViSCO Technologies Corporation

### 3.2.4. Personal computer

Personal computers that satisfy the operating environment of the engineering tool can be used.

- For the operating environment of MELSOFT VIMA, refer to "3.3.1 Operating environment".
- For the operating environment of GX Works3, refer to "GX Works3 Operating Manual".

### 3.2.5. Industrial camera (USB camera)

USB cameras can be used as industrial cameras. The following shows the industrial cameras that can be used.

Interface standard	Model	Manufacturer	Remarks
USB3 Vision	VTC-S016M00-TE	ViSCO Technologies Corporation	<ul style="list-style-type: none"> <li>Imaging speed: 240 fps</li> <li>Pixel: 1440 × 1080</li> </ul>
	VTC-S016C00-TE		
	VTC-S023M00-TE		<ul style="list-style-type: none"> <li>Imaging speed: 165 fps</li> <li>Pixel: 1920 × 1200</li> </ul>
	VTC-S023C00-TE		

■ Optional parts for industrial cameras

For industrial cameras with a C-mount lens mount standard, C-mount lenses can be attached as optical parts for condensing. Prepare them separately based on the cameras used.

### 3.2.6. High-intensity lighting

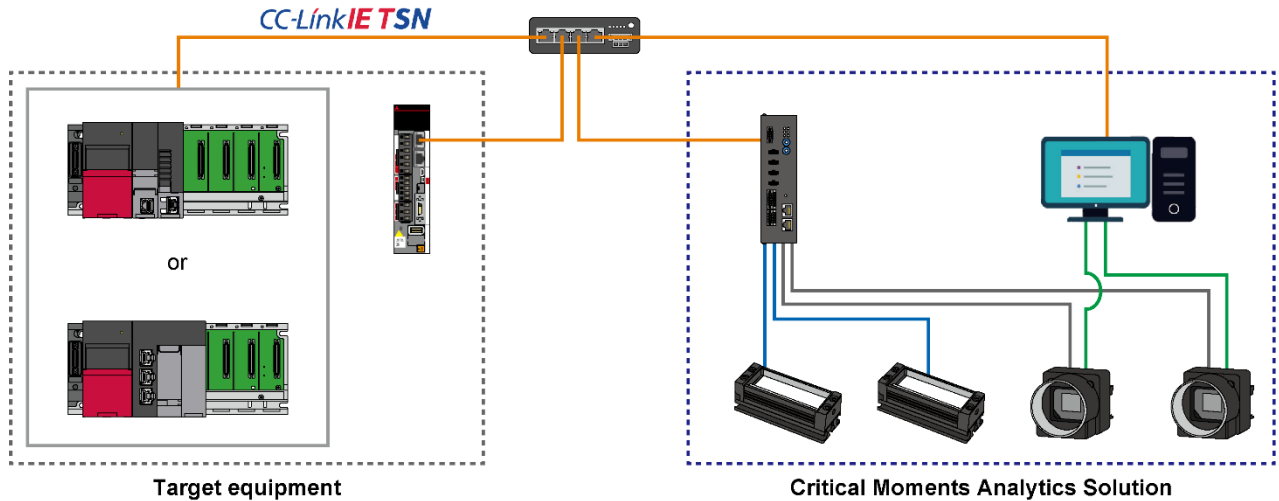
The following shows the high-intensity lighting that can be used.

Model	Manufacturer	Remarks
HB2-T5012W0-5F	ViSCO Technologies Corporation	Shape: Bar
HB2-C22X1W0-IC		Shape: Flat

### 3.2.7. Cable

The following shows the required cables.

- (1)
- (2)
- (3)
- (4)



No.	Item	Connector	Description
(1)	Ethernet cable*1	RJ45 connector	Used to connect the following devices and the switching HUB. <ul style="list-style-type: none"> <li>• Target equipment (master station, servo amplifier, etc.)</li> <li>• Lighting controller</li> <li>• Personal computer</li> </ul>
(2)	Lighting cable*2	SM3 connector	Used to connect the lighting controller and the high-intensity lighting.
(3)	e-CON cable	<ul style="list-style-type: none"> <li>• *3</li> <li>• e-CON connector</li> </ul>	Used to connect the lighting controller and the USB cameras.
(4)	USB3.1 Gen1 cable	<ul style="list-style-type: none"> <li>• Micro-B</li> <li>• Standard-A</li> </ul>	Used to connect the personal computer and the USB cameras.

\*1: For the standards of the Ethernet cables, refer to "(1) Ethernet cable".

\*2: For the lighting cable that can be used, refer to "(2) Lighting cable".

\*3: Use the connector supplied with the lighting controller.

(1) Ethernet cable

Use Ethernet cables that satisfy the following specifications.

Communication speed	Type	Standard
1 Gbps	Category 5e or higher, straight cable (shielded, STP)	Cables that satisfy the following standards: <ul style="list-style-type: none"> <li>• IEE802.3 (1000BASE-T)</li> <li>• ANSI/TIA/EIA-568-B (Category 5e)</li> </ul>

Cables for CC-Link IE TSN are available from Mitsubishi Electric System & Service Co., Ltd. (Catalogs for these cables are also available.)

In addition, the connector processing of cable length is available for your preference. Please consult your local Mitsubishi representative.

Communication speed	Type	Model	Manufacturer
1 Gbps	Category 5e or higher, straight cable (double shielded, STP)	SC-E5EW series	Mitsubishi Electric System & Service Co., Ltd.

(2) Lighting cable

The following shows the lighting cables that can be used.

Model	Manufacturer	Remarks
VTLC-48RN-03F	ViSCO Technologies Corporation	3 m extension cable
VTLC-48RN-05F		5 m extension cable
VTLA-48NW-E		2:1 branch cable

### 3.2.8. Switching HUB and device stations

Only the CC-Link IE TSN certification Class B products can be used as switching HUBs or device stations.

For CC-Link IE TSN Class of each device, check the website of CC-Link Partner Association or the catalog or manual of each product.

### 3.3. Engineering Tool

The following lists the engineering tools to be used in this solution.

Engineering Tool	Model	Version
MELSOFT VIMA	SW1DNN-VIMA-M	1.000A or later
GX Works3	SW1DND-GXW3-J	1.060N or later*1

\*1: Use version 1.125F or later when using the MELSEC MX Controller MX-R model.

#### 3.3.1. Operating environment

The following table shows the operating environment for MELSOFT VIMA.

Item		Description
Personal computer	Main body	Personal computer running Microsoft® Windows®
	OS*1	Windows® 11 (Home, Pro, Enterprise, Education, IoT Enterprise LTSC 2024)
	Processor	Intel Core® i5 2.5 GHz or more
	Required memory	Recommended: 32 GB or more Required: 16 GB or more
Available storage space		Recommended: SSD*2 400 GB or more Required: 40 GB or more
Communication interface		Data transfer rate 1 Gbps or more*3
Display		Resolution 1920 × 1080 pixels or more
.NET Framework		.NET Framework 4.6 or later

\*1: Operation is not guaranteed on operating systems other than those described above.

\*2: NVMe Gen4 or later SSD can be used.

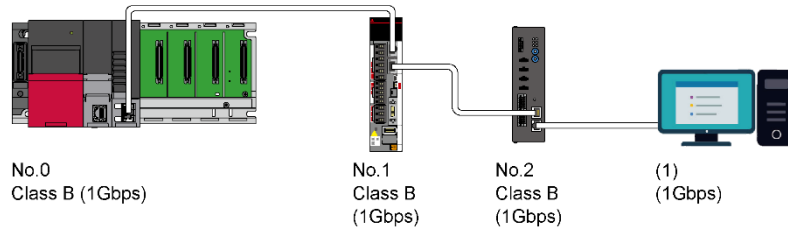
\*3: When using a USB-to-LAN adapter, use a USB 3.0-compatible USB-to-LAN adapter.

## 3.4. Network Configuration

This section shows the network topologies that are supported by MELSOFT VIMA and CC-Link IE TSN. Regardless of network configuration, only a single MELSOFT VIMA can be connected to the network.

### 3.4.1. Line topology

Only a single MELSOFT VIMA can be connected at the end of the network.



No. 0: Master station

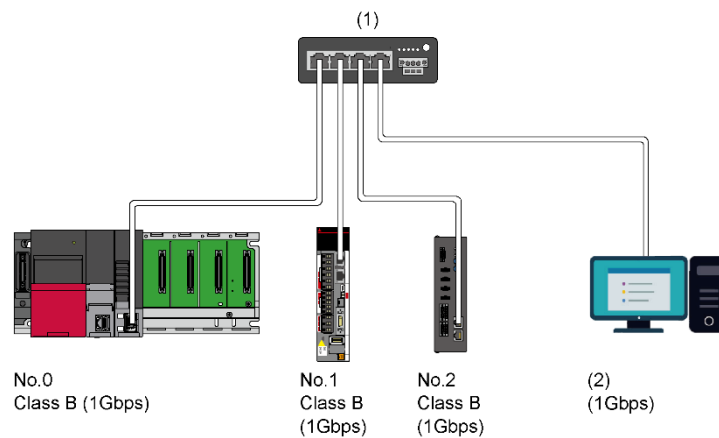
No. 1, No. 2: Remote stations

Class B: CC-Link IE TSN Class B devices

(1) MELSOFT VIMA

### 3.4.2. Star topology

Only a single MELSOFT VIMA can be connected to an available port on the switching HUB.



No. 0: Master station

No. 1, No. 2: Remote stations

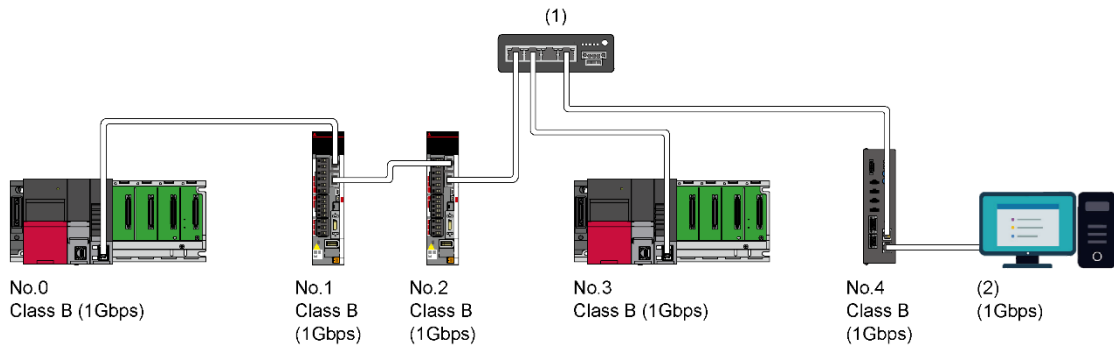
Class B: CC-Link IE TSN Class B devices

(1) Switching HUB (CC-Link IE TSN Class B-compatible)

(2) MELSOFT VIMA

### 3.4.3. Mixture of the line topology and star topology

Only a single MELSOFT VIMA can be connected at the end of the network.



No. 0: Master station

No. 1, No. 2, No. 4: Remote stations

No. 3: Local station

Class B: CC-Link IE TSN Class B devices

(1) Switching HUB (CC-Link IE TSN Class B-compatible)

(2) MELSOFT VIMA

## 3.5. Usage Precautions

---

This section describes the precautions for using this solution.

### 3.5.1. Ring topology

---

This solution does not support ring topologies. When MELSOFT VIMA is connected to a ring topology system, TSN data cannot be collected.

### 3.5.2. Ethernet adapter with multiple IP addresses assigned

---

When multiple IP addresses are assigned to a single Ethernet adapter, the IP address with the smallest setting (value) is used by being compared with the IP addresses in the order of the first octet → second octet → third octet → fourth octet.

Example: When "192.168.3.100" is added to the Ethernet adapter with "192.168.4.133" enabled, the IP address "192.168.3.100" is used.

### 3.5.3. Connection to the switching HUB

---

■ Remote station with CC-Link IE TSN certification Class A

Do not connect any remote station with CC-Link IE TSN certification Class A and this solution to the same switching HUB. Doing so may cause issues such as repeated disconnection and reconnection of the remote station with CC-Link IE TSN certification Class A, which may affect the control of the remote station.

■ Ethernet devices

Do not connect any Ethernet device to the switching HUB to which this solution is connected. Because cyclic data is sent to the connected Ethernet devices, communication may become unavailable depending on the Ethernet device.

### 3.5.4. Use of USB-to-LAN adapter

---

- When using a USB-to-LAN adapter, use a USB 3.1 Gen1 (USB 3.0)-compatible USB-to-LAN adapter.  
If a USB-to-LAN adapter that is not compatible with USB 3.1 Gen1 (USB 3.0) is used, this solution may not operate properly.
- When connecting multiple USB devices to the personal computer using a USB hub, the personal computer may fail to import the data received with the USB-to-LAN adapter and the data may be lost.

Whether data is being received correctly in the operating environment can be checked from the image information of the collected data and TSN control data information. If data is not received correctly, the message "This frame failed to receive images." or "This frame failed to receive TSN control data." is displayed for the corresponding frame.

For details, refer to "Critical Moments Analytics Solution User's Manual".

### **3.5.5. Communication mode of the master station**

---

The master station supports only the multicast mode as its communication mode.

Because MELSOFT VIMA is to be connected to the end of the network, if the communication mode of the master station is not the multicast mode, cyclic data cannot be transmitted to MELSOFT VIMA.

For the setting procedure of the communication mode of the master station, refer to "4.10.1(1) Communication mode setting" and "4.10.2(1) Communication mode setting".

### **3.5.6. Communication speed**

---

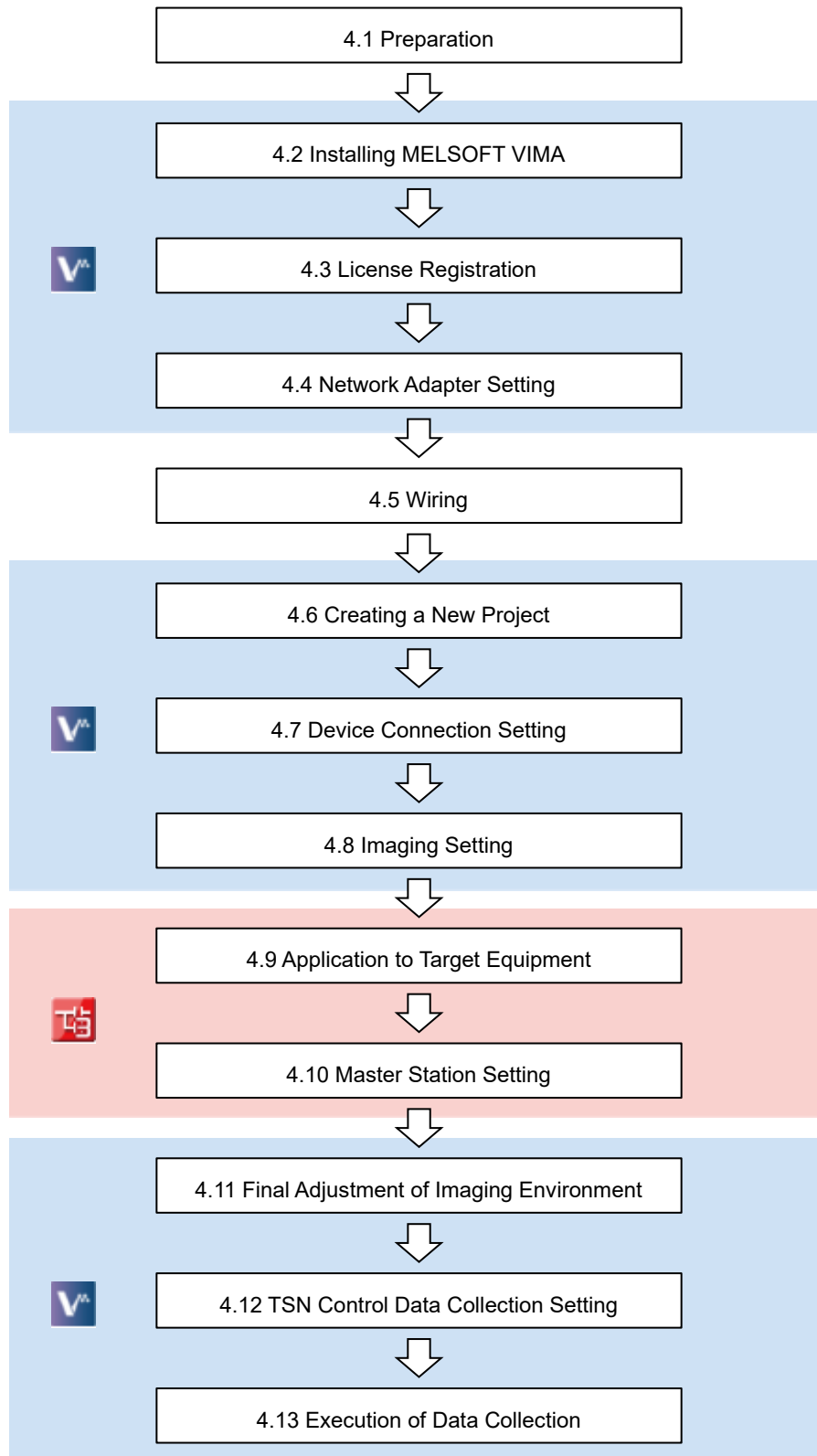
This solution supports only a configuration with a communication speed of 1 Gbps. Set the communication speed of each device to 1 Gbps. In addition, use devices that can communicate at 1 Gbps.

For setting the communication speed of the master station, refer to the manual of each master station.

## 4. INTRODUCTION PROCEDURE

The following shows the procedure for introducing this solution (until data collection is executed).

For the detailed introduction procedure and analysis of the collection data, refer to "Critical Moments Analytics Solution User's Manual".



## 4.1. Preparation

Before starting up Critical Moments Analytics Solution, prepare and set each device according to the system configuration.

### 4.1.1. Preparing devices

Prepare the devices required for starting up the solution and configuring settings according to the system configuration. For details of each device, refer to "3.2 Components".

Device/software		Description
Lighting controller		Used to control the camera imaging and lighting.
Personal computer	MELSOFT VIMA	Used to set and operate this solution.
Lighting (High-intensity lighting)		Used as the lighting for the target equipment.
Camera (USB camera)		Used for imaging the target equipment.
Lens		Attach to the camera to be used. For instructions on how to attach, refer to the manuals of the camera and the lens to be used.
Ethernet cable		Used to connect the personal computer and lighting controller.
USB3.1 Gen1 cable		Used to connect the personal computer and the camera.
e-CON cable		Used to connect the lighting controller and the camera.
Lighting cable		Used to connect the lighting controller and the lighting.

### 4.1.2. USB camera driver setting

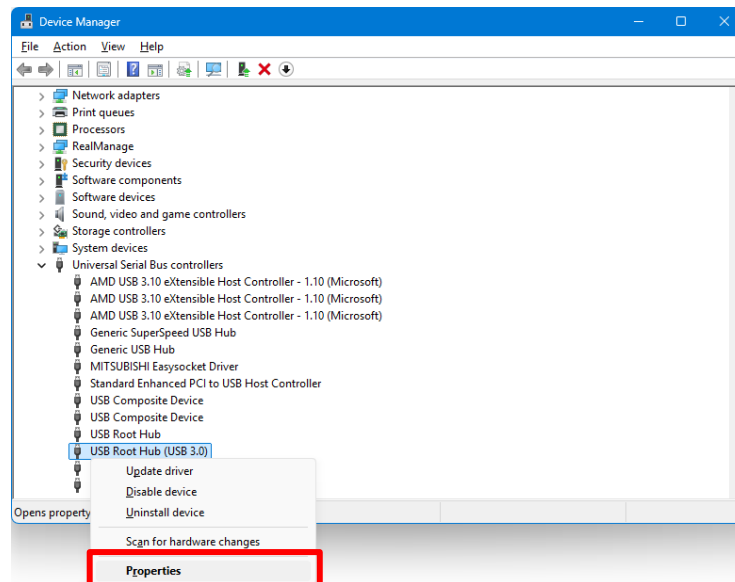
To disable the energy-saving mode of the USB camera, change its driver settings. An example of the setting procedure is shown below.

#### ⚠ CAUTION

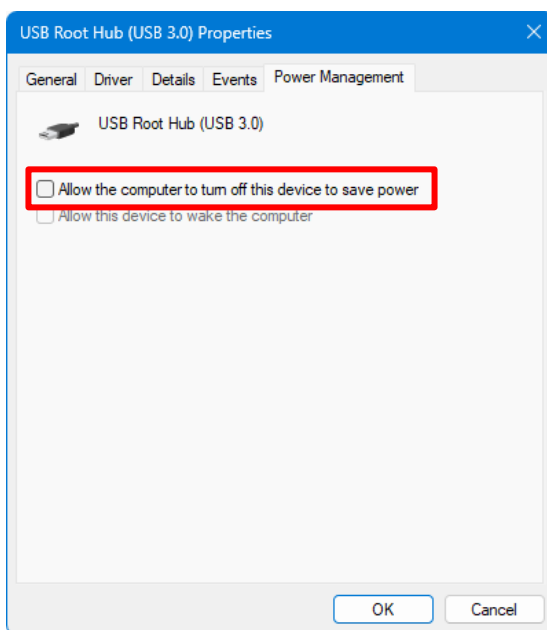
When the energy-saving mode of the USB camera is enabled, the camera automatically enters sleep mode if it is not operated for a certain period of time. When the camera enters sleep mode, the following symptoms may occur.

- Disconnection between MELSOFT VIMA and the camera
- Camera image stop
- Imaging data missing

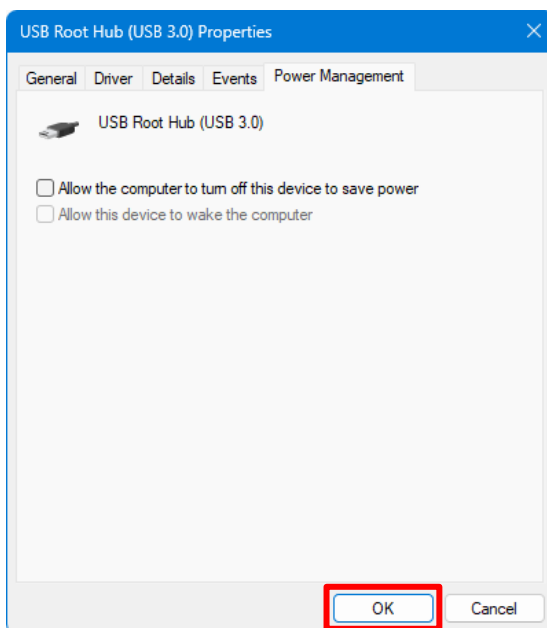
1. Connect the USB camera to the USB 3.0 port on the personal computer.
2. In Device Manager in Windows, right-click [Universal Serial Bus controllers] → [USB Root Hub (USB 3.0)] and select [Properties].



3. Click the [Power Management] tab, and clear the check box for "Allow the computer to turn off this device to save power".



4. Click the [OK] button.



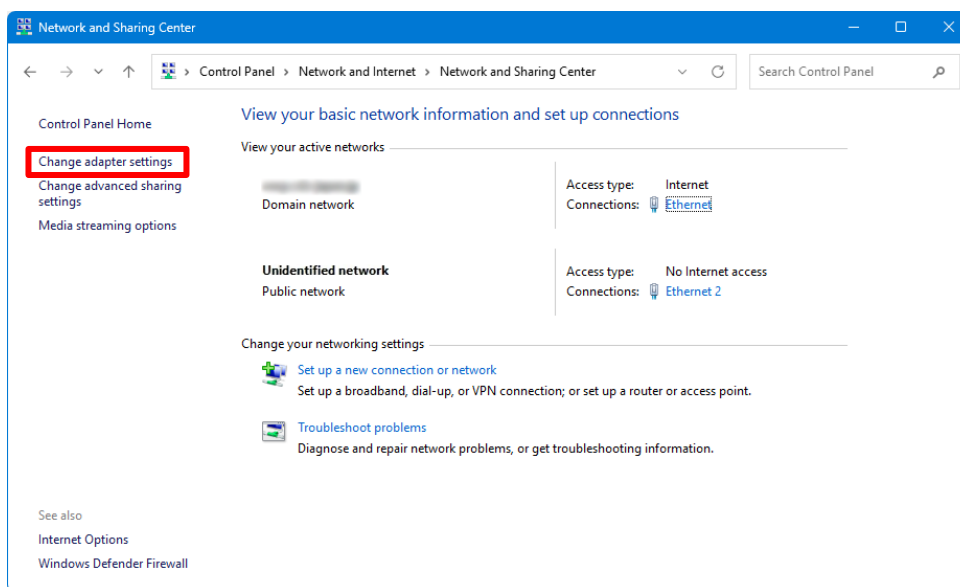
### 4.1.3. Network setting for the personal computer

Set the IP address and subnet mask for the network adapter that will be used by MELSOFT VIMA. An example of the setting procedure is shown below.

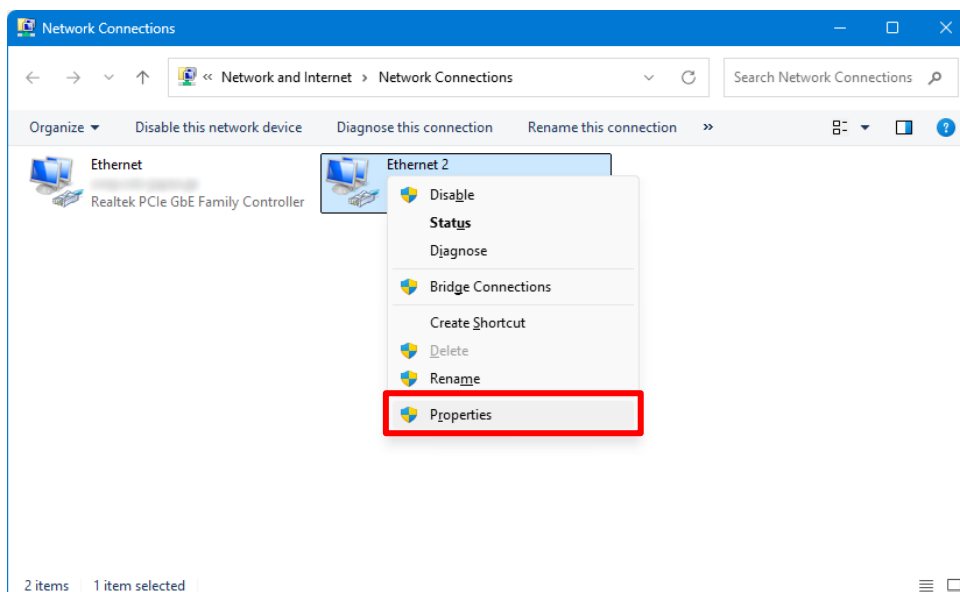
#### ⚠ CAUTION

For this solution, do not use a network adapter that is already used by other software. MELSOFT VIMA may not operate properly.

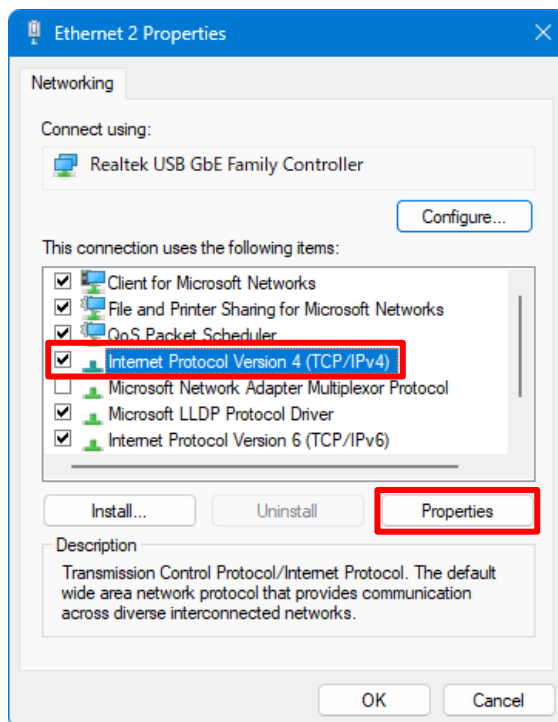
1. In the Windows Control Panel, click [Network and Internet] → [Network and Sharing Center] → [Change adapter settings].



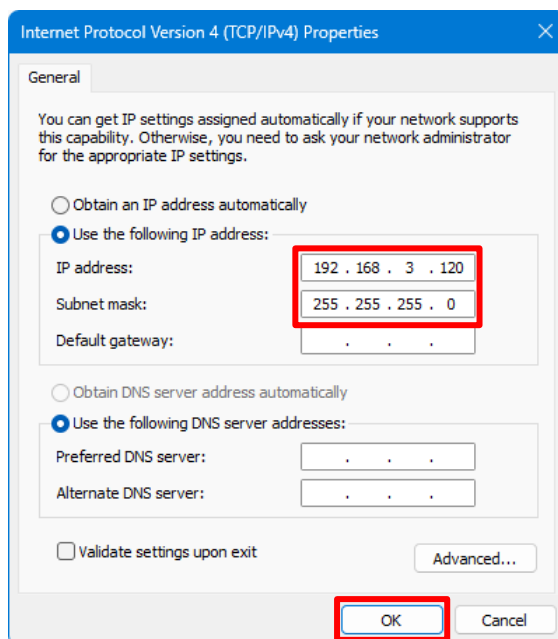
2. Right-click the network adapter to use, and then click [Properties].



3. Select "Internet Protocol Version 4 (TCP/IPv4)", and then click [Properties].



4. Set the IP address and subnet mask according to the system, and then click the [OK] button.



**CAUTION**

Set the IP address of the personal computer so that the first to third octets match those of the IP address of the device to be connected. Make sure to set an IP address that is different from other devices.

### 4.1.4. IP address setting of the lighting controller

---

Set the IP address of the lighting controller.

The first to third octets of the IP address of the lighting controller are set to "192.168.3" by default. The fourth octet can be set using the station number setting switch on the lighting controller.

 **TIPS**

---

In GX Works3, the first to third octets of the IP address of the lighting controller change according to the first to third octets of the set IP address of the master station. In MELSOFT VIMA, change the IP address of the specifying lighting controller to be the same as the IP address setting of the master station.

---

1. Rotate the station number setting switch on the lighting controller to set the station number (fourth octet of the IP address).

Use x1 and x16 (hexadecimal numbers) for the setting.

Example: To set the fourth octet to "30", set the station number setting switch as follows.



 **CAUTION**

---

Make sure to set a station number that is different from other devices.

If the same station number is used on the same network, communication may fail because the device may communicate with an unintended device.

---

## 4.2. Installing MELSOFT VIMA

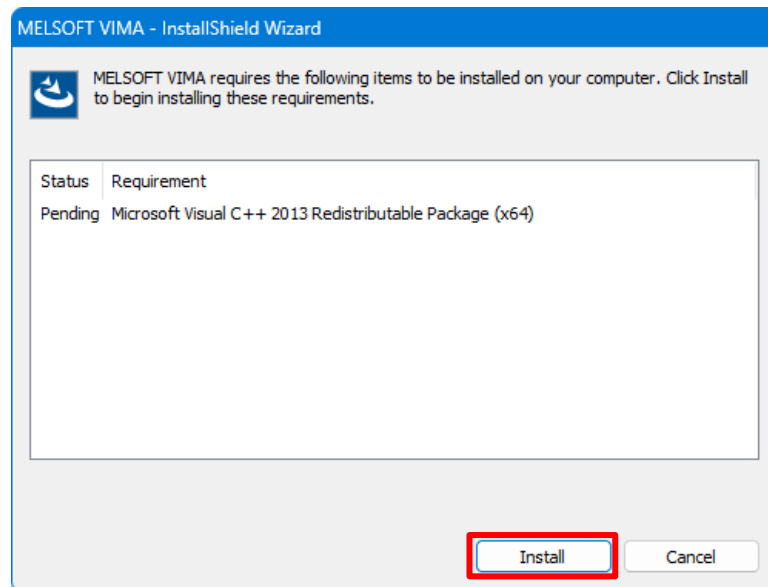
The following shows the installation procedure for MELSOFT VIMA.

Even after MELSOFT VIMA is installed by following this procedure, it cannot be used until the license registration is complete. After the installation, obtain and register the license by following the procedure in "4.3 License Registration".

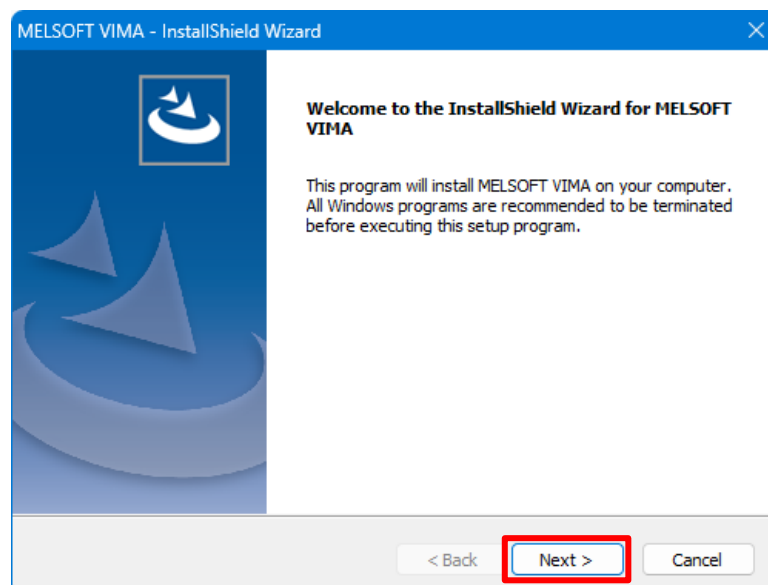
### ⚠ CAUTION

To obtain a license for MELSOFT VIMA, the hardware code that is registered after the installation is required. Thus, MELSOFT VIMA must be installed before obtaining the license.

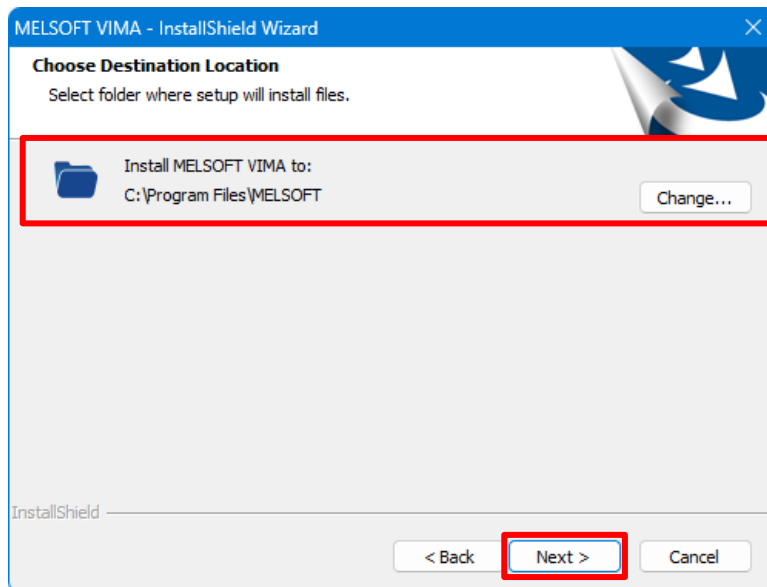
1. Double-click "setup.exe" in the installer folder\*1 for MELSOFT VIMA.  
\*1: If it is placed in a network drive, MELSOFT VIMA may not operate properly after the installation.
2. When the redistribution package required for operating MELSOFT VIMA is not installed, the following window appears. Click the [Install] button.



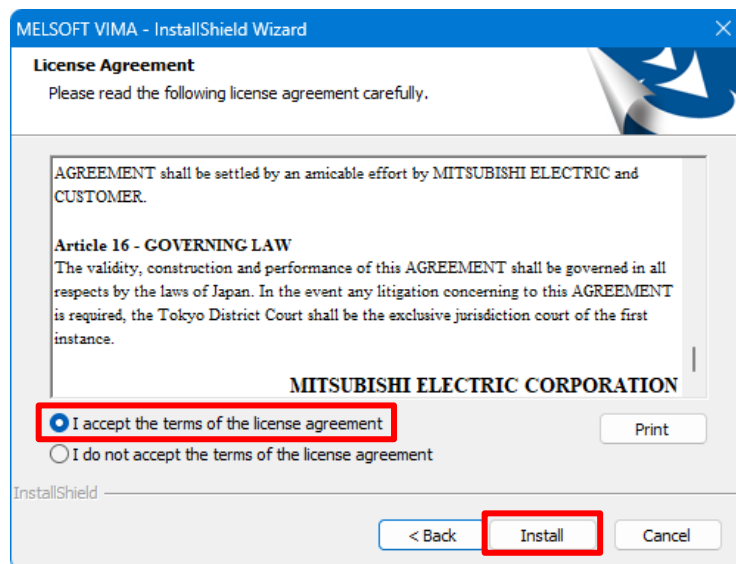
3. When the setup window appears, click the [Next] button.



4. Select the installation destination, and then click the [Next] button.

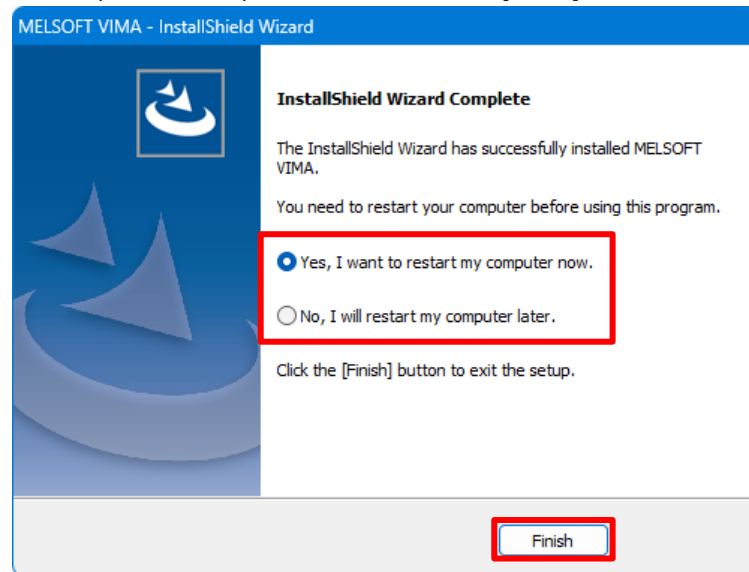


5. Check the license agreement, and then select "I accept the terms of the license agreement".  
6. Click the [Install] button.



7. The following window appears when the installation is complete.

Select whether to restart the personal computer, and then click the [Finish] button.



8. When "Yes, I want to restart my computer now." is selected in Step 7, the personal computer automatically restarts. When "No, I will restart my computer later." is selected, restart the personal computer.

## 4.3. License Registration

To use MELSOFT VIMA, obtain and register the license file.

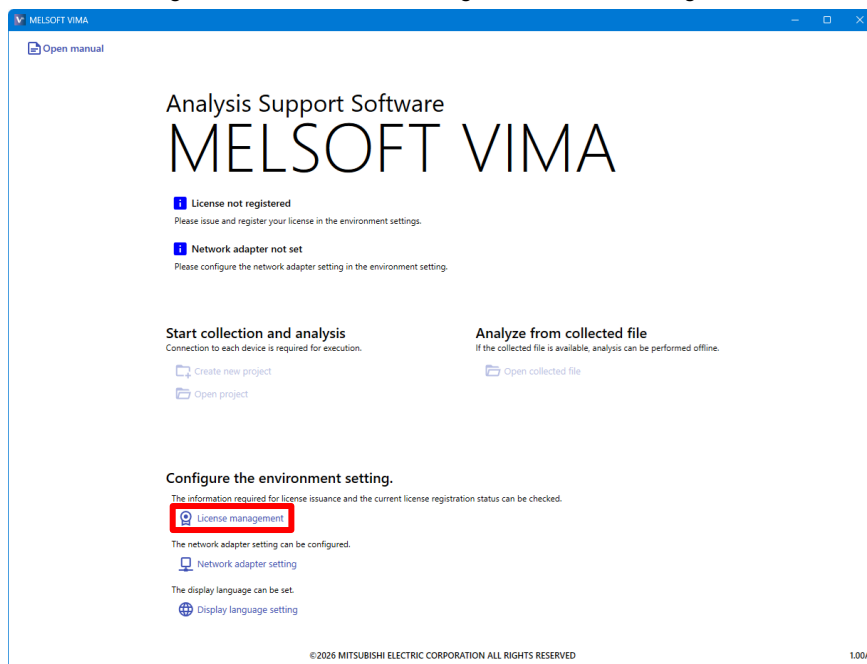
### 4.3.1. Obtaining the license file

Acquire the license file of MELSOFT VIMA from "MELSOFT VIMA License Request Form" in the MITSUBISHI ELECTRIC Factory Automation website. (A hardware code is required for the application.)

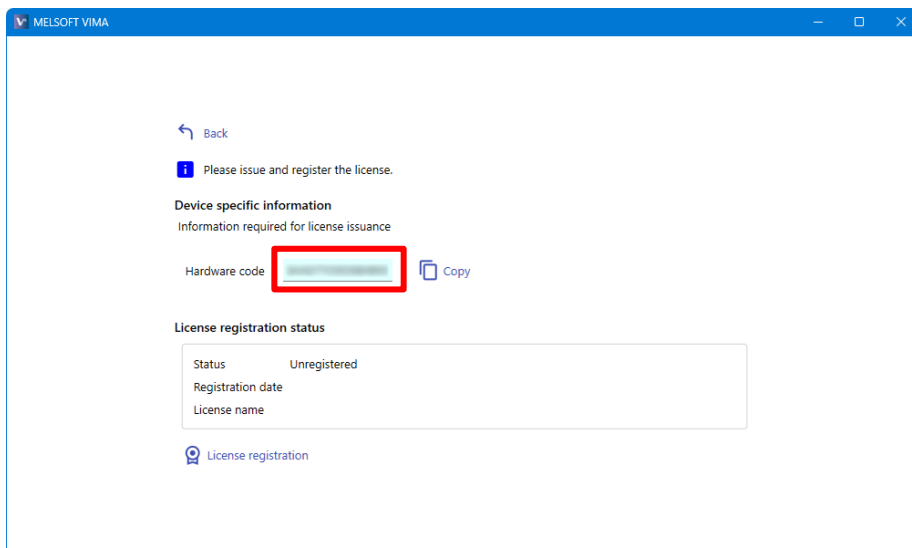
After the application, the license key file (vima\_license\_[16 characters of hardware code].lic) will be sent as an e-mail attachment.

The following shows the detailed acquisition procedure.

1. Start MELSOFT VIMA.
2. On the top screen, click "Configure the environment setting." → "License management".



3. Copy "Hardware code" under "Device specific information".  
Clicking the [Copy] button copies the code.



- Submit the hardware code to "MELSOFT VIMA License Request Form" in the MITSUBISHI ELECTRIC Factory Automation website to request the license issuance.

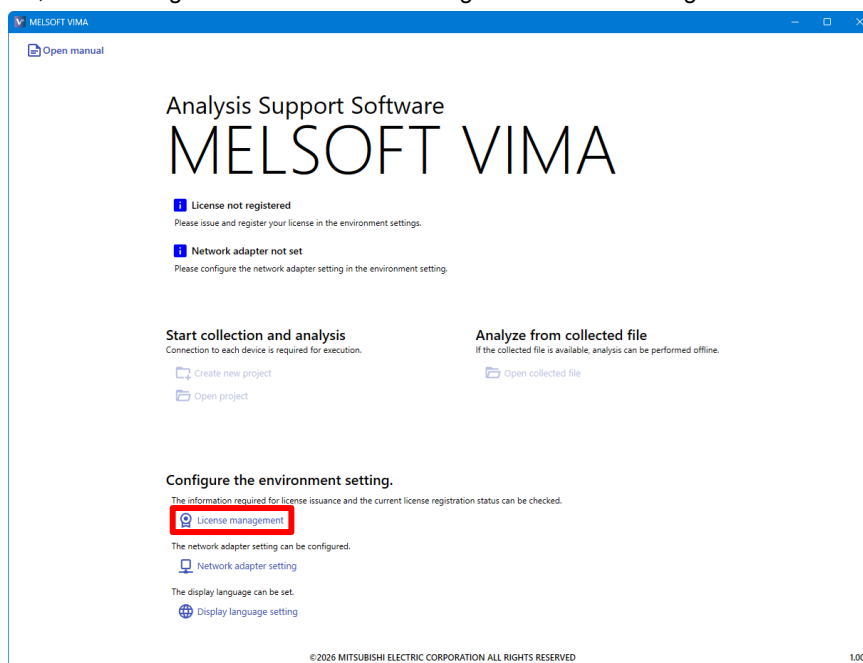
### ⚠ CAUTION

- The hardware code required for the license issuance is a unique ID. It is set for each device (personal computer) and cannot be used for other devices (personal computers).
- The license file is sent to the entered e-mail address. Be careful not to enter an incorrect e-mail address.
- Do not change the name and extension (.lic) of the license file.

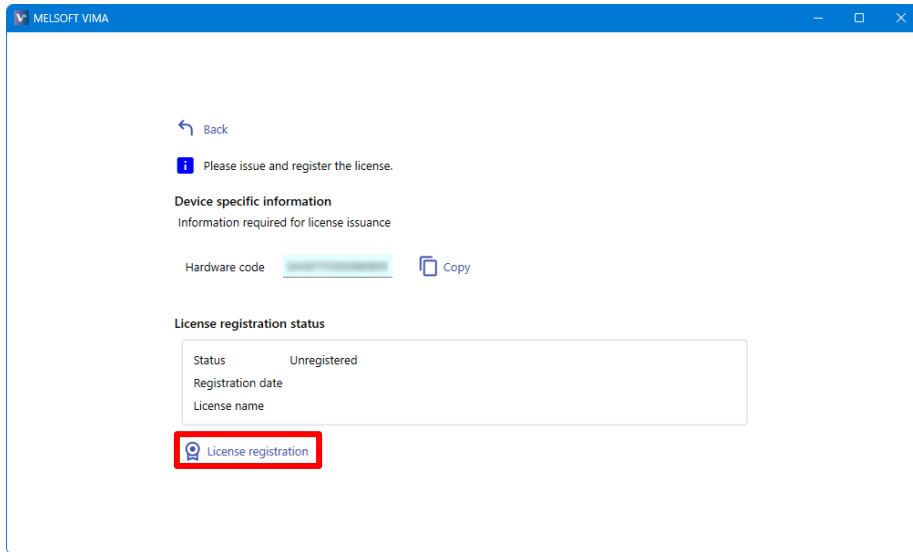
## 4.3.2. License file registration

Register the acquired license file in MELSOFT VIMA.

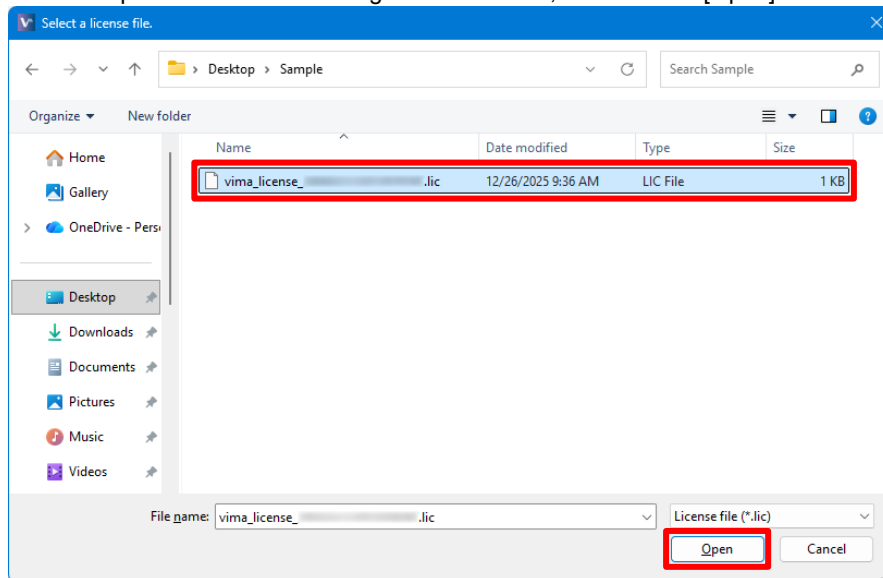
- Start MELSOFT VIMA.
- On the top screen, click "Configure the environment setting." → "License management".



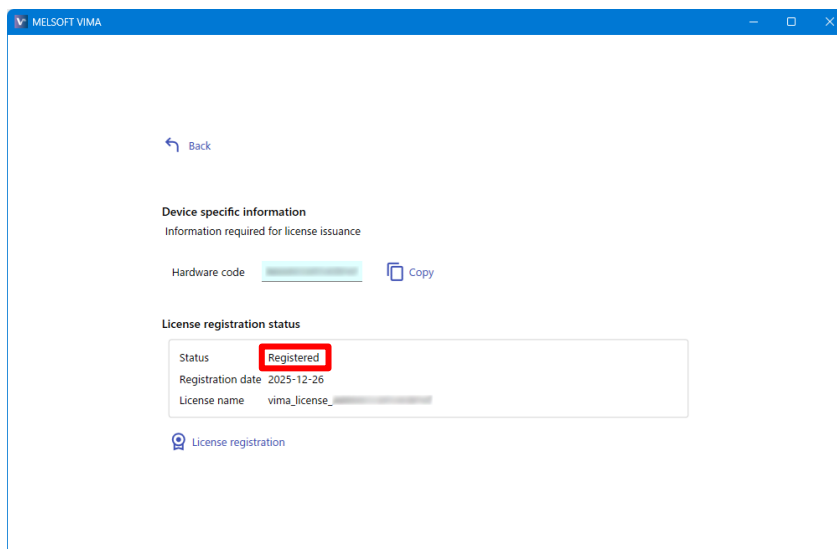
3. Click the [License registration] button.



4. Select the license file acquired in "4.3.1 Obtaining the license file", and click the [Open] button.



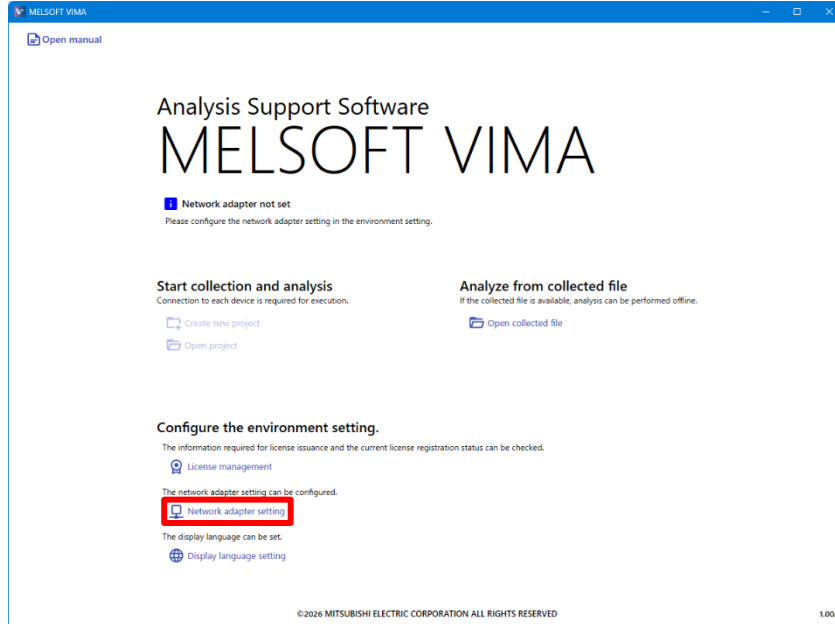
When the license registration is complete, "Status" under "License registration status" becomes "Registered".



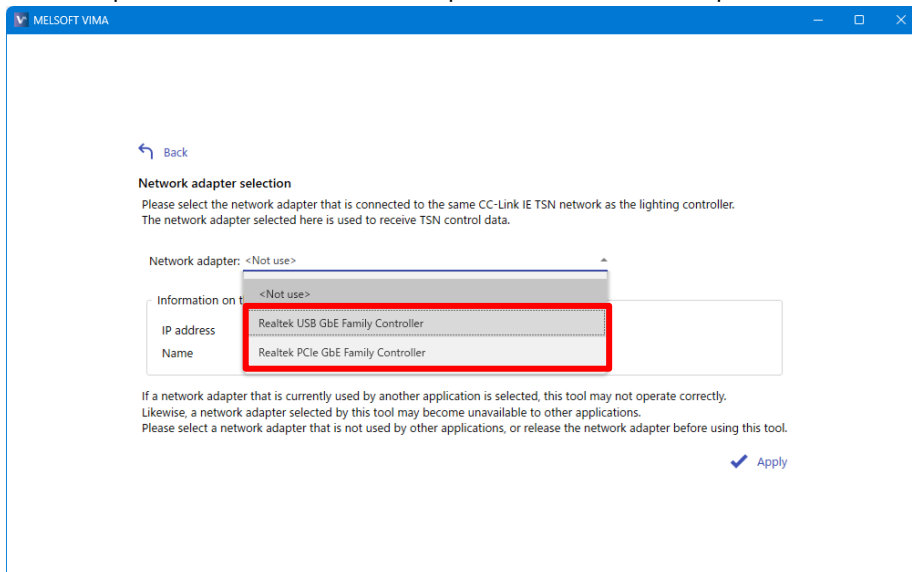
## 4.4. Network Adapter Setting

The following shows the procedure for setting the network adapter to be used in MELSOFT VIMA.

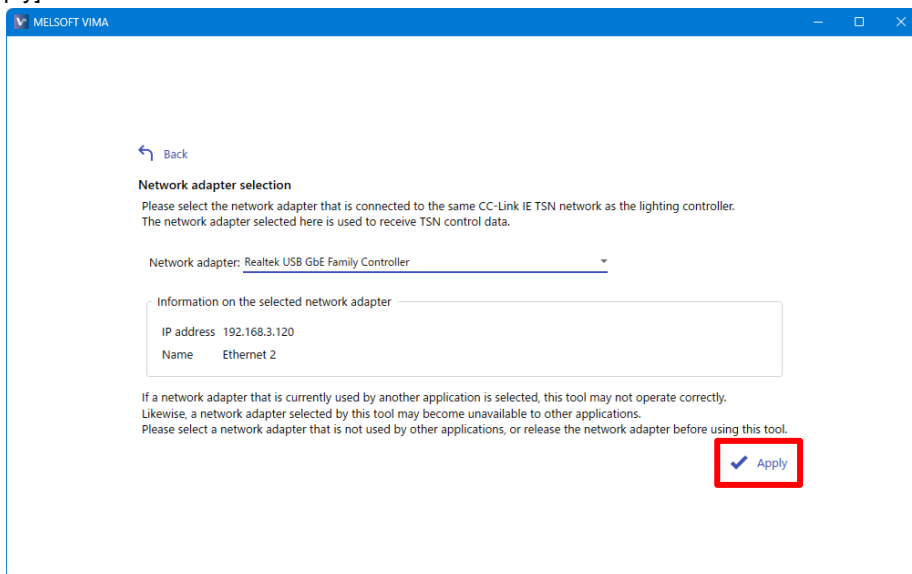
1. On the top screen of MELSOFT VIMA, click "Configure the environment setting" → "Network adapter setting".



2. Select the network adapter to be used in "Network adapter" under "Network adapter selection".



3. Click the [Apply] button.



When the setting is successfully applied, the message "The setting has been applied." appears.

**⚠ CAUTION**

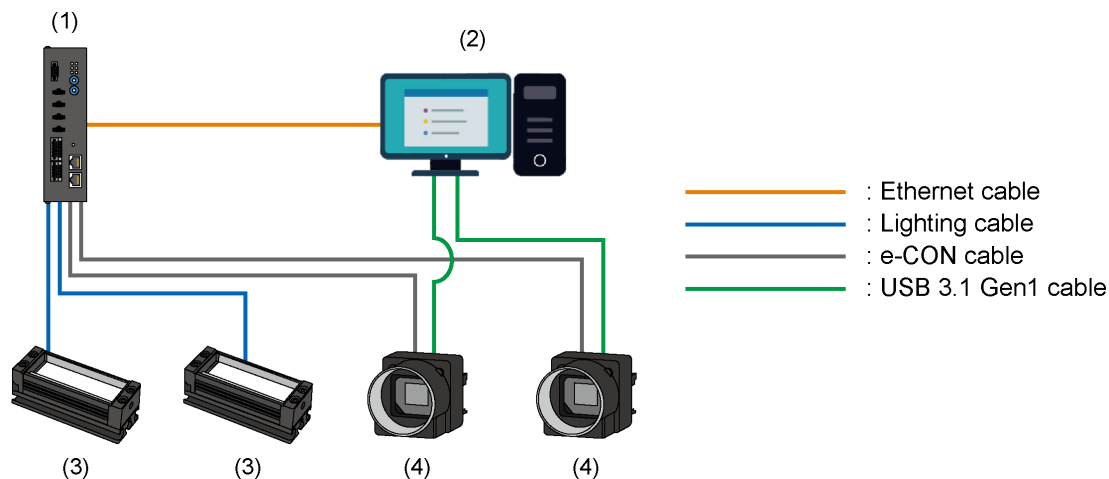
When "<Not use>" is selected in Step 2, the network adapter setting of MELSOFT VIMA is disabled.  
To use the network adapter currently used in MELSOFT VIMA in another software, disable the network adapter setting.

## 4.5. Wiring

Connect each device.

### 4.5.1. Wiring MELSOFT VIMA and each device

Connect MELSOFT VIMA to each device prepared in "4.1.1 Preparing devices". The following shows the connection example.



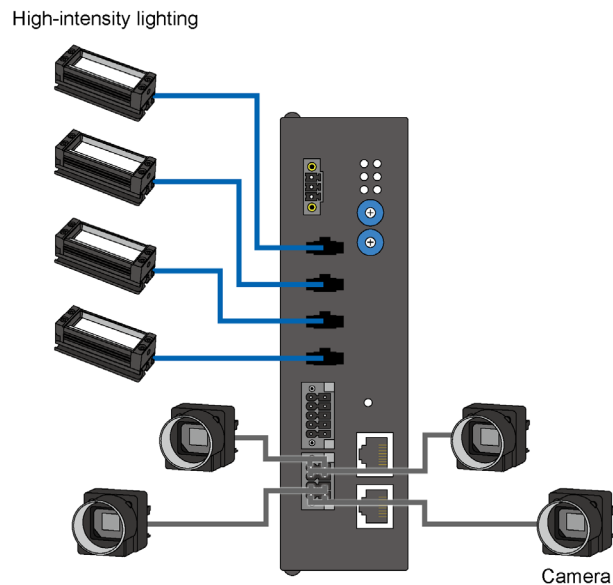
No.	Device/software	Description
(1)	Lighting controller	<ul style="list-style-type: none"> <li>Connect to the personal computer with an Ethernet cable.</li> <li>Connect to the high-intensity lighting with lighting cables.</li> <li>Connect to the USB cameras with e-CON cables.</li> </ul>
(2)	Personal computer MELSOFT VIMA	<ul style="list-style-type: none"> <li>Connect to the lighting controller with an Ethernet cable.</li> <li>Connect to the USB cameras with USB 3.1 Gen1 cables.</li> </ul>
(3)	High-intensity lighting	Connect to the lighting controller with lighting cables.
(4)	Camera (with lens attached)	<ul style="list-style-type: none"> <li>Connect to the personal computer with USB 3.1 Gen1 cables.</li> <li>Connect to the lighting controller with e-CON cables.</li> </ul>

#### ⚠ CAUTION

Always power off the devices before connecting/disconnecting cables and performing wiring. Failure to do so may cause circuit damage, fire, or electric shock.

## 4.5.2. Wiring for lighting controller control port

Connect an industrial camera or high-intensity lighting to each control port of the lighting controller. The following shows the wiring example.



When connecting the cameras and lighting to the control ports of the lighting controller, wire them according to the following conditions.

For details, refer to "Flash Light Controller MVTFC1-0448-00 Hardware Guide".

- Allocate one or more units of lighting to a single camera. (When connecting a single camera to a single lighting controller, up to four\*<sup>1</sup> units of lighting can be allocated.)
- When connecting a set of a single camera and a single unit of lighting to the lighting controller, wire the camera and the lighting respectively to the imaging control port and lighting control port of the same CH.

\*1: When a branch cable is used, two units of lighting can be connected to a lighting control port of 1 CH, thus up to eight units of lighting can be allocated.

## 4.6. Creating a New Project

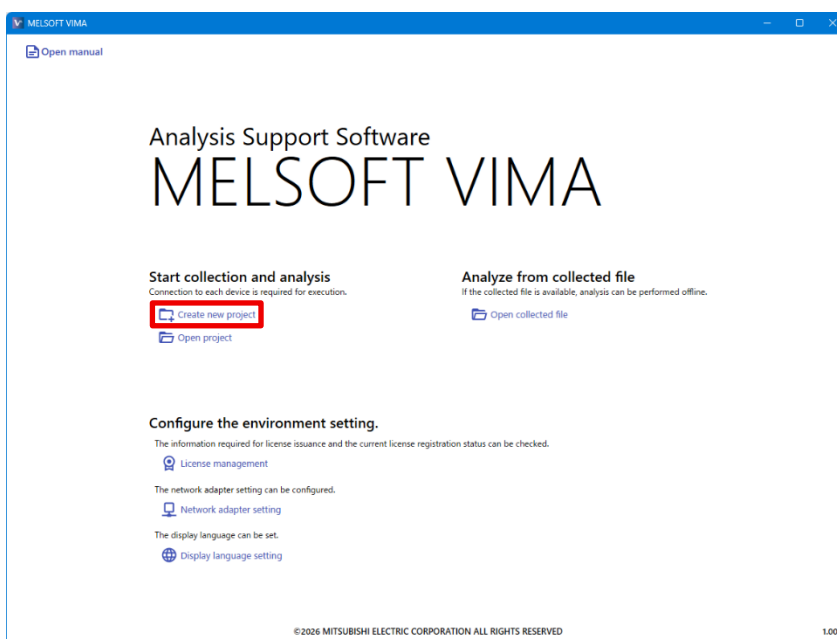
Create a new MELSOFT VIMA project.

1. Turn on the power of each device.

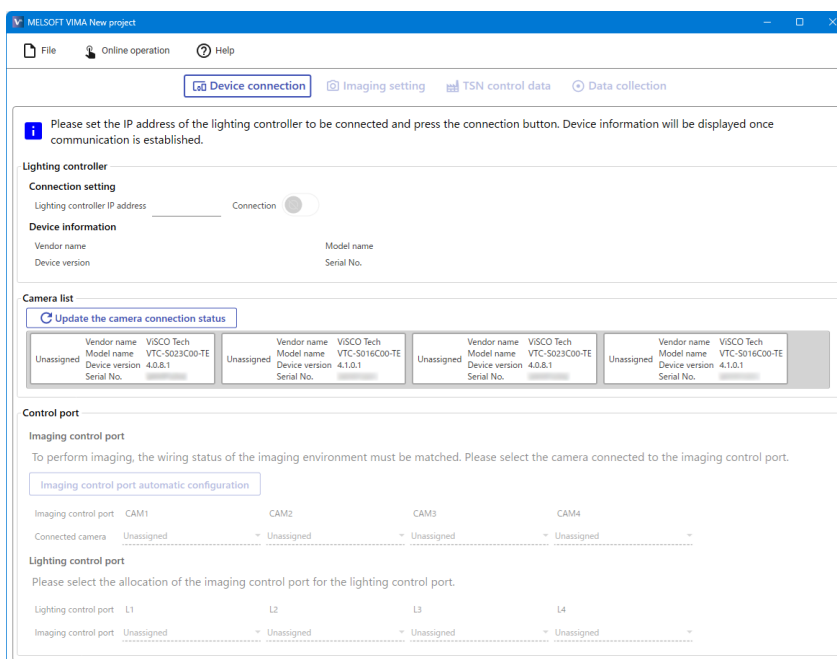
### ⚠ CAUTION

Do not touch the camera or lighting while the power is ON or immediately after it has been turned off as they become very hot. There is a risk of burns. When using the device in an enclosed space, cool it using a fan or air.

2. Start MELSOFT VIMA.
3. On the top screen, click "Start collection and analysis" → "Create new project".



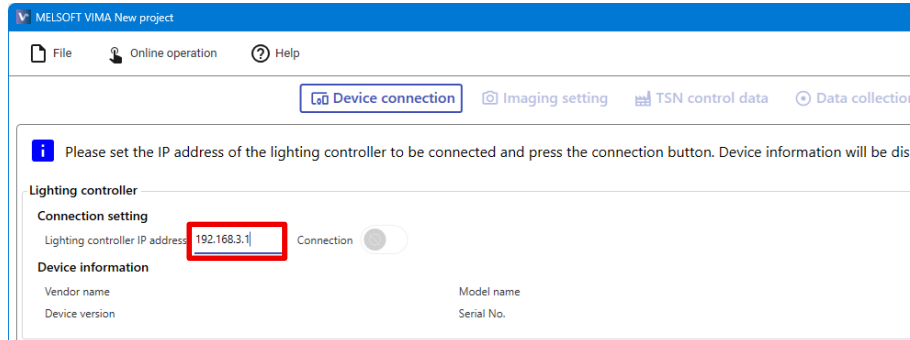
A new project will be created.



## 4.7. Device Connection Setting

Connect MELSOFT VIMA to the lighting controller and cameras. In addition, set the control port of the lighting controller.

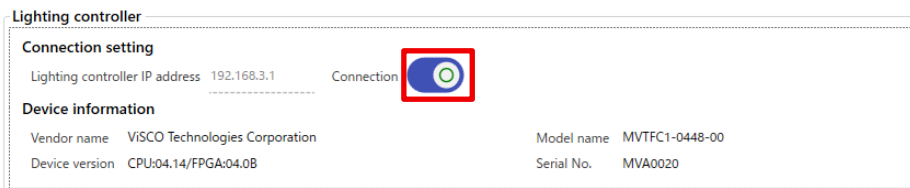
1. In "Lighting controller IP address" under "Lighting controller" in the device connection screen, enter the IP address of the lighting controller.



### TIPS

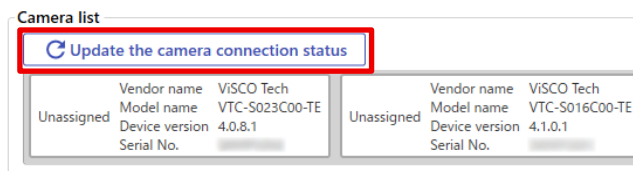
The first to third octets of the IP address of the lighting controller are set to "192.168.3" by default. Set the fourth octet to the same value as the station number set in "4.1.4 IP address setting of the lighting controller".

2. Click the [Connection] button to turn it on.



### CAUTION

If the camera to be used is not displayed in "Camera list" at this point, click the [Update the camera connection status] button to update the camera connection status.



- Click the [Imaging control port automatic configuration] button in the "Imaging control port" section under "Control port".

**Control port**

**Imaging control port**  
To perform imaging, the wiring status of the imaging environment must be matched. Please select the camera connected to the imaging control port.

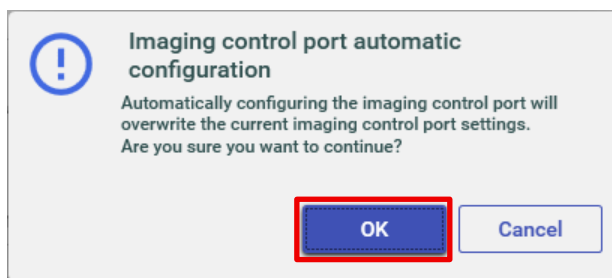
**Imaging control port automatic configuration**

Imaging control port	CAM1	CAM2	CAM3	CAM4
Connected camera	Unassigned	Unassigned	Unassigned	Unassigned

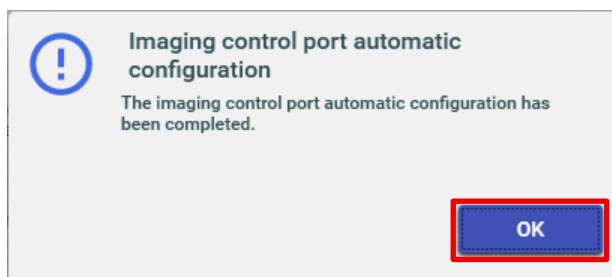
**Lighting control port**  
Please select the allocation of the imaging control port for the lighting control port.

Lighting control port	L1	L2	L3	L4
Imaging control port	Unassigned	Unassigned	Unassigned	Unassigned

- When the following dialog box appears, click the [OK] button.



- When the automatic configuration is complete, the following dialog box appears. Click the [OK] button.



Each control port is automatically set based on the connection status of the imaging control ports of the lighting controller.

**Control port**

**Imaging control port**  
To perform imaging, the wiring status of the imaging environment must be matched. Please select the camera connected to the imaging control port.

**Imaging control port automatic configuration**

Imaging control port	CAM1	CAM2	CAM3	CAM4
Connected camera	VTC-S016C00-TE Serial No.	VTC-S023C00-TE Serial No.	VTC-S016C00-TE Serial No.	VTC-S023C00-TE Serial No.

**Lighting control port**  
Please select the allocation of the imaging control port for the lighting control port.

Lighting control port	L1	L2	L3	L4
Imaging control port	CAM1	CAM2	CAM3	CAM4

**TIPS**

- When there is a camera or lighting that is not to be used in this solution, manually change the assignment setting to "Unassigned".
- To assign multiple units of lighting to a single camera, manually change the assignment of lighting.

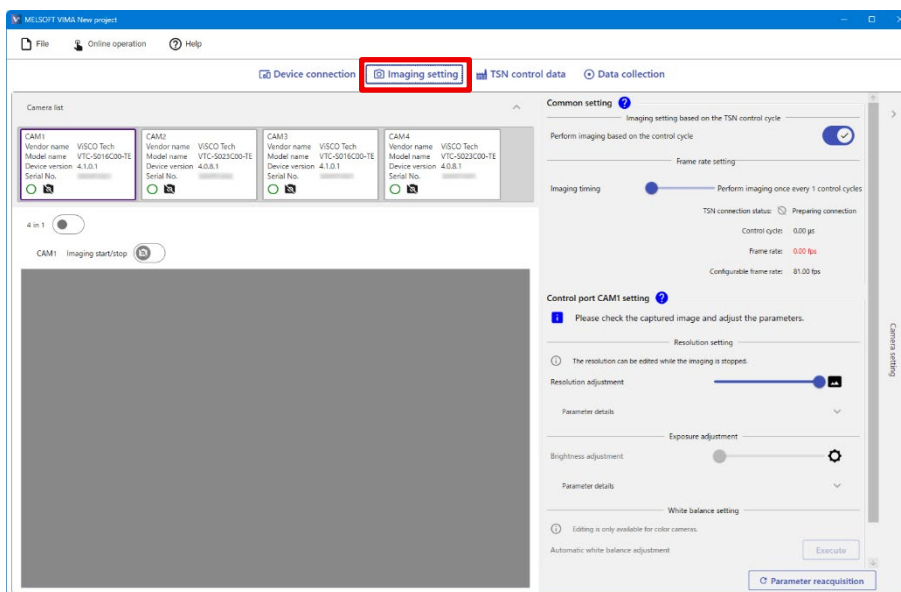
## 4.8. Imaging Setting

Adjust the imaging environment by setting the parameters for the lighting controller, cameras, and lighting.

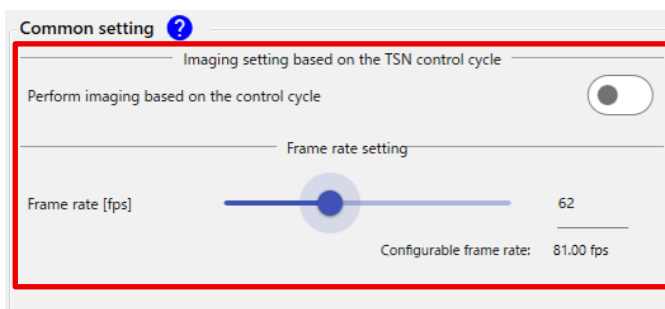
### 4.8.1. Setting the frame rate

Configure settings for performing imaging of each camera without the master station.

1. Click the [Imaging setting] button. The imaging setting function is displayed.



2. Set "Common setting" of the [Camera setting] window as follows.



Item	Description	
Imaging setting based on the TSN control cycle	Perform imaging based on the control cycle	Set to off.
Frame rate setting	Frame rate [fps]	Set a value assuming operation of this solution (when performing imaging synchronously with the TSN control data of the target equipment).

#### TIPS

The value displayed in "Configurable frame rate" indicates the maximum frame rate that can currently be set. If the "Configurable frame rate" is lower than the desired frame rate, adjusting the resolution using the procedure described in "4.8.2(1) Adjusting the resolution" can increase the "Configurable frame rate".

### 4.8.2. Adjusting the camera and lighting

Start imaging on each camera in the live view, and adjust the parameters according to the imaging condition.

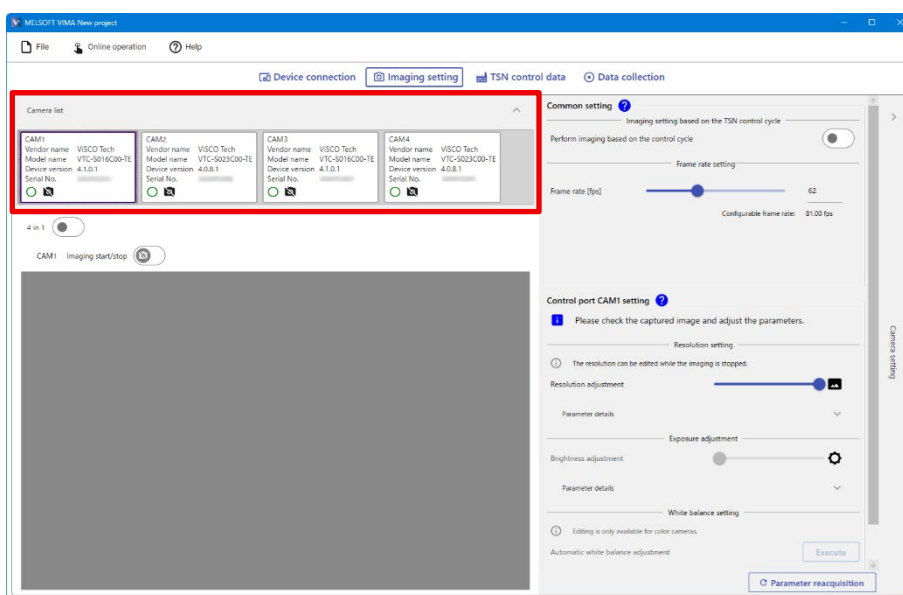
#### ⚠ CAUTION

When a camera starts imaging, the lighting turns on or flashes.

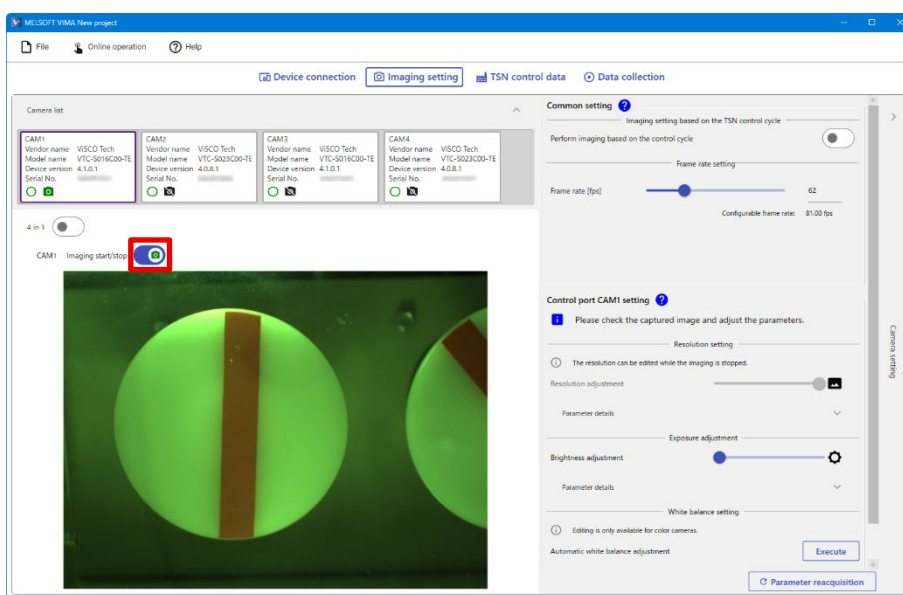
The high-intensity lighting to be used in this solution emits highly intense strobe light. Do not look directly at the light emitting part. Doing so may cause corneal or retinal damage due to the strong radiation.

Use a dimming/shielding plate or similar so that light does not get in your eyes when using the lighting.

1. From the [Camera list] window, select the camera to start capturing images in the live view.



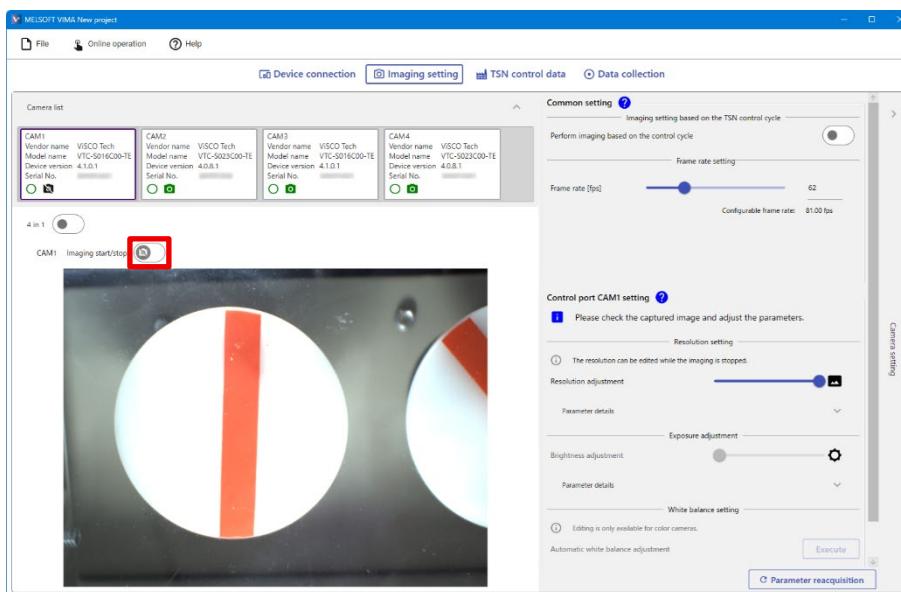
2. Click the [Imaging start/stop] button to turn it on.  
Imaging is started and the camera image is displayed.



(1) Adjusting the resolution

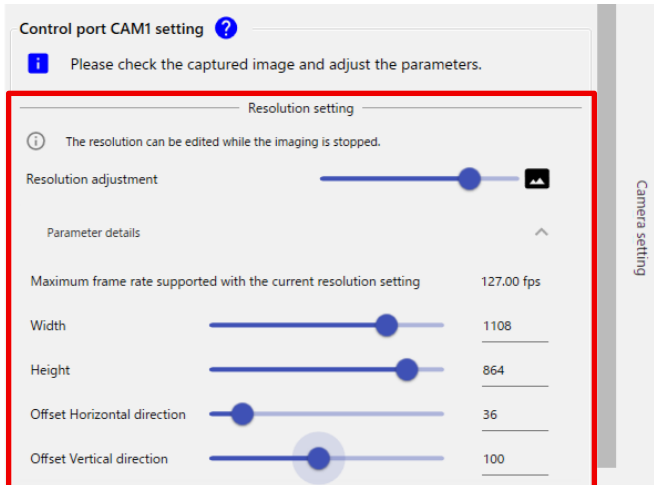
To change the frame rate relative to the speed of the imaging target (to increase "Configurable frame rate") or to change the resolution of the camera image, adjust the resolution of the camera image.

1. Click the [Imaging start/stop] button of the adjustment target camera to turn it off.



2. Adjust "Resolution adjustment" according to the imaging condition in the "Resolution setting" section under any of "Control port CAM1 setting" to "Control port CAM4 setting"<sup>\*1</sup> in the [Camera setting] window.

\*1: The setting is displayed according to the camera selected in Step 1.



Item	Description
Resolution adjustment	Adjust the level of the resolution (width × height). (The imaging size will be adjusted based on the center of the camera image.) To increase "Configurable frame rate", lower the level of resolution.
Parameter details	Click the [ ∨ ] button to display.
Width	Adjust the width of the camera image.
Height	Adjust the height of the camera image.
Offset Horizontal direction	Adjust the offset in the horizontal direction.
Offset Vertical direction	Adjust the offset in the vertical direction.

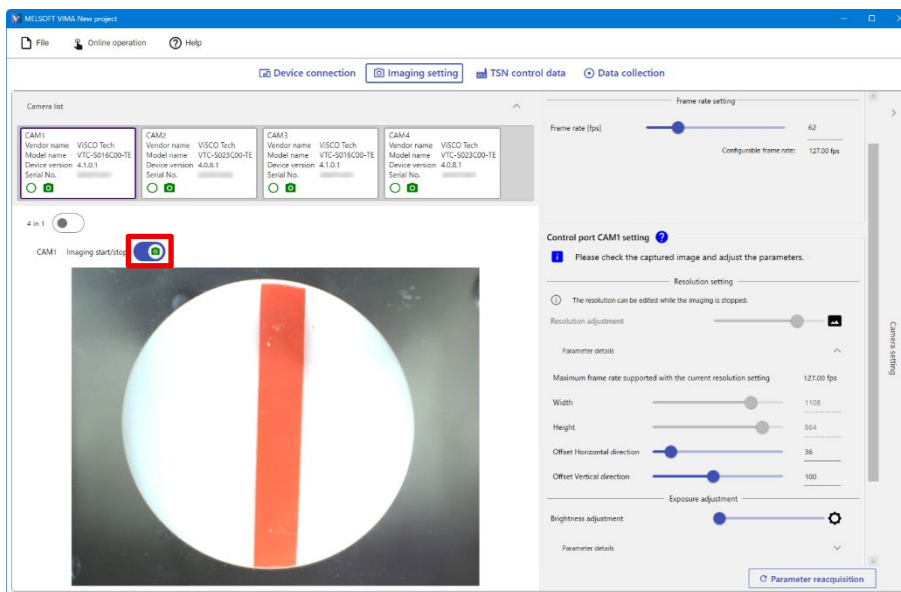
**TIPS**

For "Maximum frame rate supported with the current resolution setting", the maximum frame rate that can be used with the corresponding camera is displayed.

When multiple cameras are connected, "Configurable frame rate" in the frame rate setting section shows the lowest "Maximum frame rate supported with the current resolution setting" among all cameras.

To increase "Configurable frame rate", adjust the resolutions of all cameras.

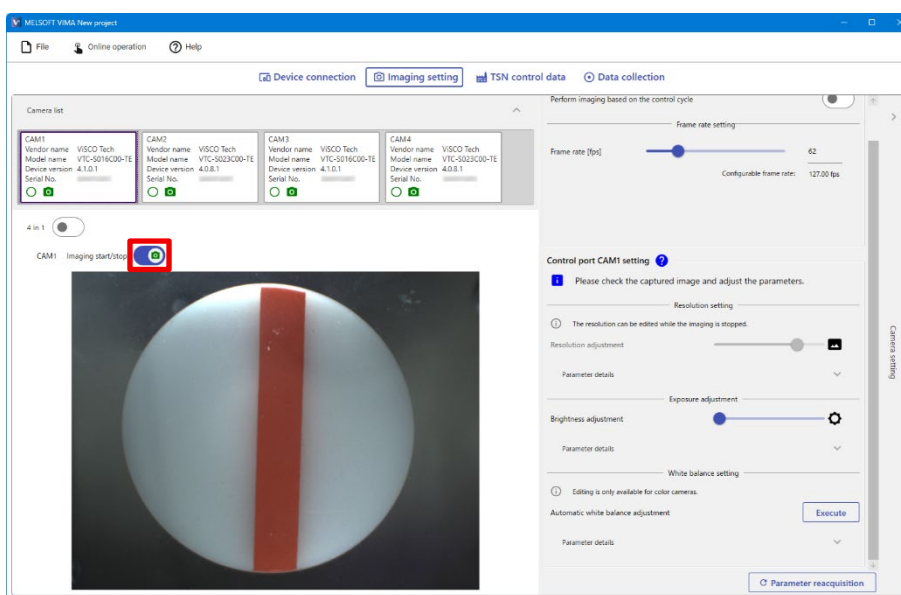
3. Click the [Imaging start/stop] button to turn it on. The camera image changes to the set resolution.



- (2) Adjusting the brightness

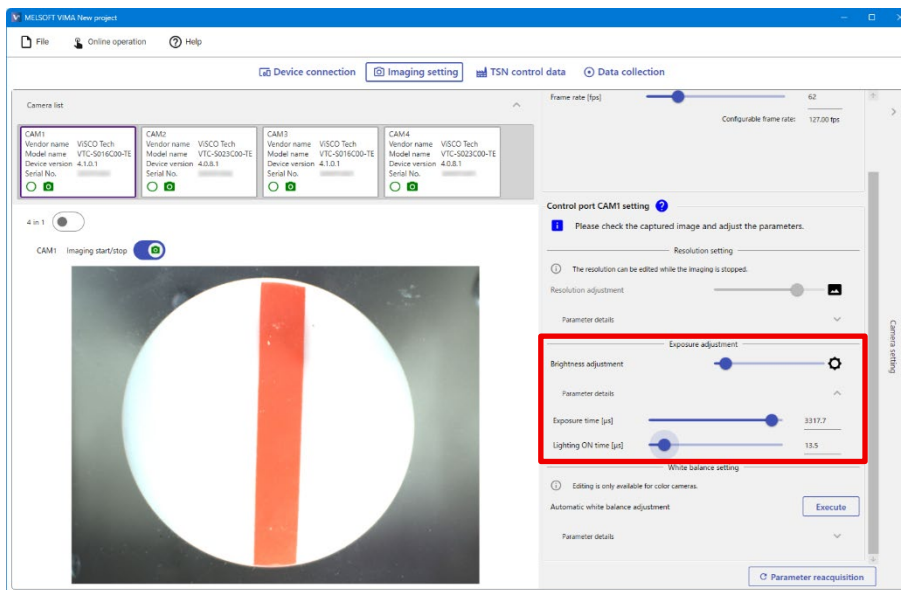
When the camera image is dark or too bright, adjust the brightness of the camera and lighting.

1. Click the [Imaging start/stop] button of the adjustment target camera to turn it on.



- While checking the camera image, adjust "Exposure adjustment" under any of "Control port CAM1 setting" to "Control port CAM4 setting"<sup>\*1</sup> in the [Camera setting] window.

\*1: The setting is displayed according to the camera selected in Step 1.



Item	Description
Brightness adjustment	Adjust it to achieve adequate brightness. (Move the slider so that the value gradually become larger from the lower limit value.)
Parameter details	Click the [ ∨ ] button to display.
Exposure time [µs]	Adjust the brightness of the camera.
Lighting ON time [µs]	Adjust the time during which the lighting is ON.

TIPS

- When the desired brightness cannot be achieved with the exposure adjustment (when the camera image is still dark), the methods listed below can brighten the camera image. Perform them as necessary.

Item	Notes
Increasing the aperture with the aperture ring on the lens (lower the f-number)	Note that increasing the aperture of the lens makes the depth of field (the range that appears to be focused) shallower.
Adjusting the camera position and direction of the lighting	The cameras and lighting become very hot while the power is ON. Be careful of burns while adjusting them.
Increasing the number of lighting units	When increasing the number of lighting units, you will need to perform wiring and configure settings again. Perform all the procedures from "4.5 Wiring" to this setting again.

- When the camera image is blurry, shortening the exposure time can decrease the motion blur of the image.

(3) Adjusting the focus and field of vision

When the angle of view of the camera image is misaligned or the camera image is out of focus, adjust the field of view and the focus of the camera.

1. Adjust the placement of the target camera according to the desired field of view.
  - When the field of view is narrow: Increase the working distance. (When increasing the working distance is impossible, change the lens to one with a shorter focal length.)
  - When the field of view is wide: Reduce the working distance. Or, change the lens to one with a longer focal length.
2. Rotate the focus ring on the lens of the target camera to adjust the focus.

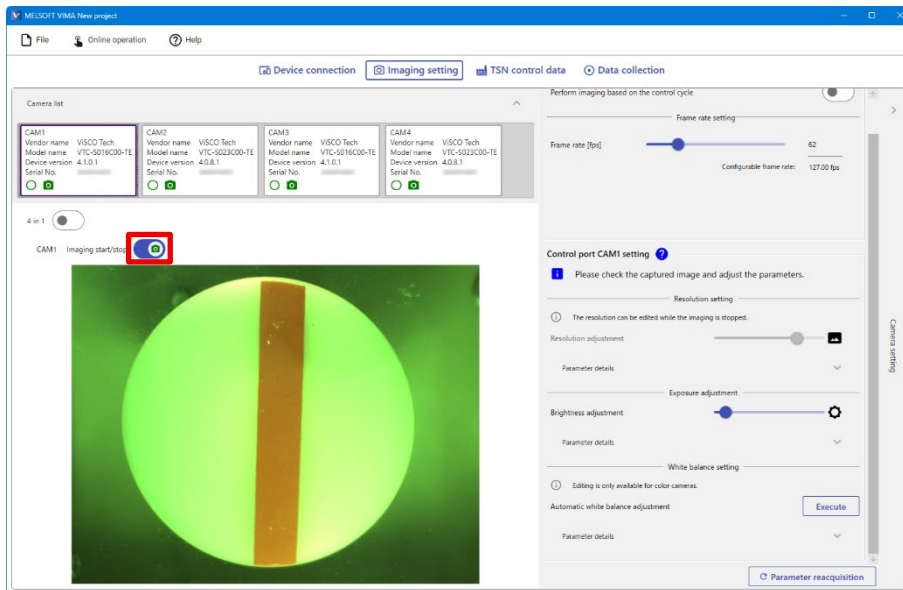
**CAUTION**

The cameras become very hot while the power is ON. Be careful of burns while adjusting them.

(4) Adjusting the white balance

If there is a problem with the color tone of the camera image when a color camera is used, adjust the white balance of the camera image.

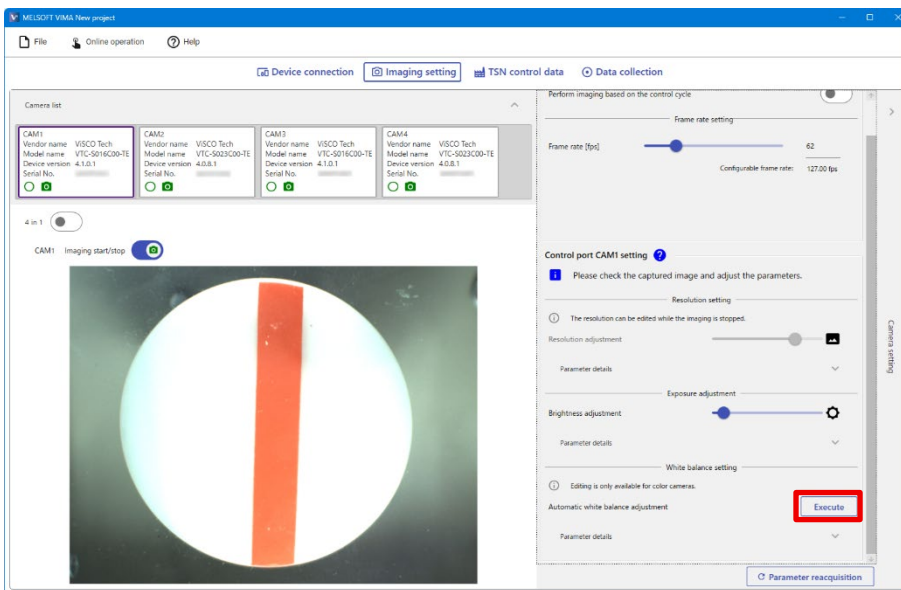
1. Click the [Imaging start/stop] button of the adjustment target camera to turn it on.



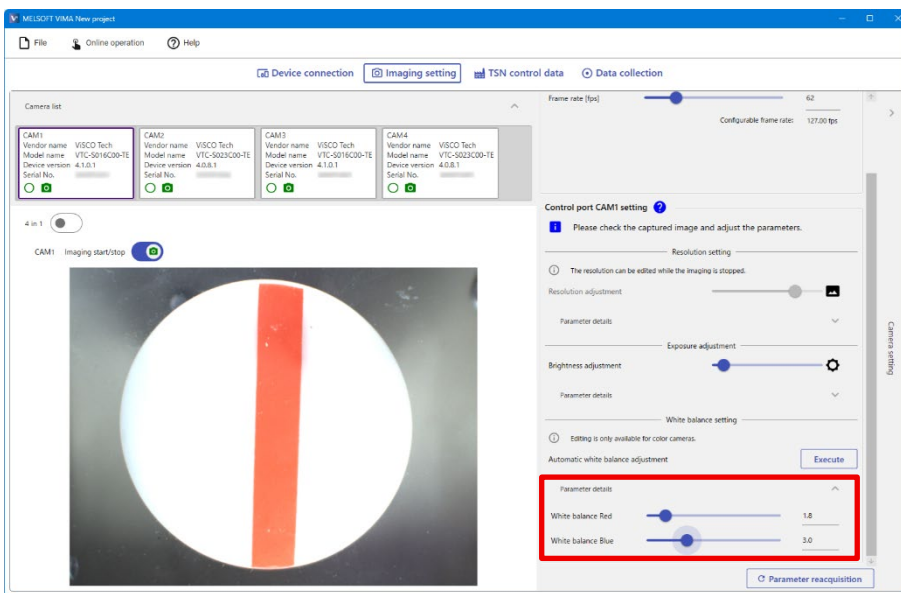
2. "Control port CAM1 setting" to "Control port CAM4 setting"<sup>\*1</sup> in the [Camera setting] window → Click the [Execute] button for "Automatic white balance adjustment".

The white balance is automatically adjusted.

\*1: The setting is displayed according to the camera selected in Step 1.



3. To perform more detailed white balance adjustment, click the [ ] button of the "Parameter details" section, and adjust the following items.

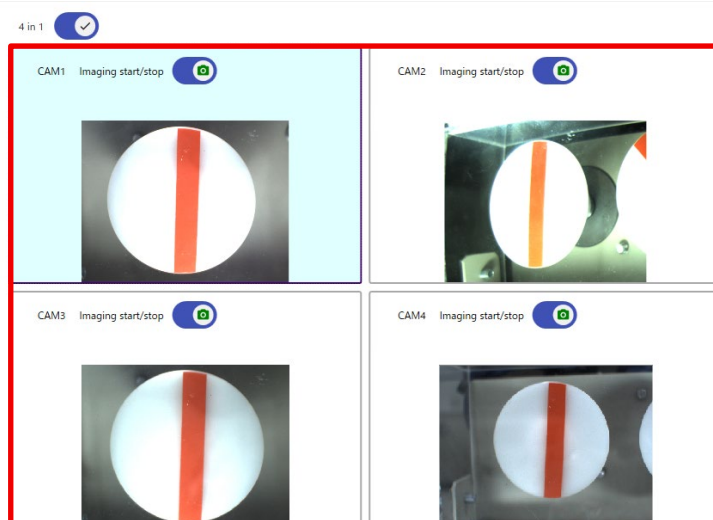


Item	Description
White balance Red	Adjust the red tone (R gain).
White balance Blue	Adjust the blue tone (B gain).

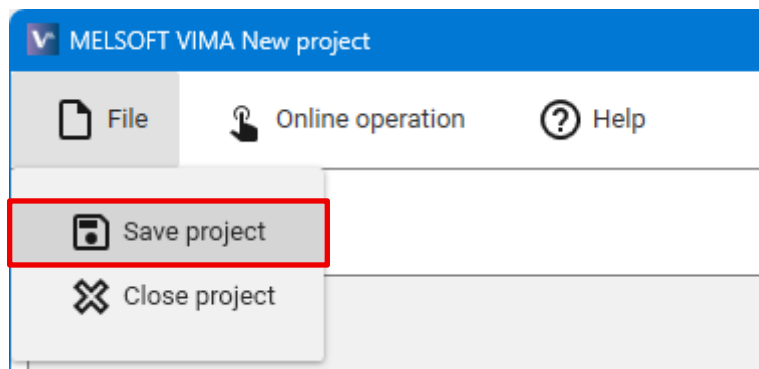
### 4.8.3. Saving the project

When the adjustments of the camera image are completed, save the settings as a project.

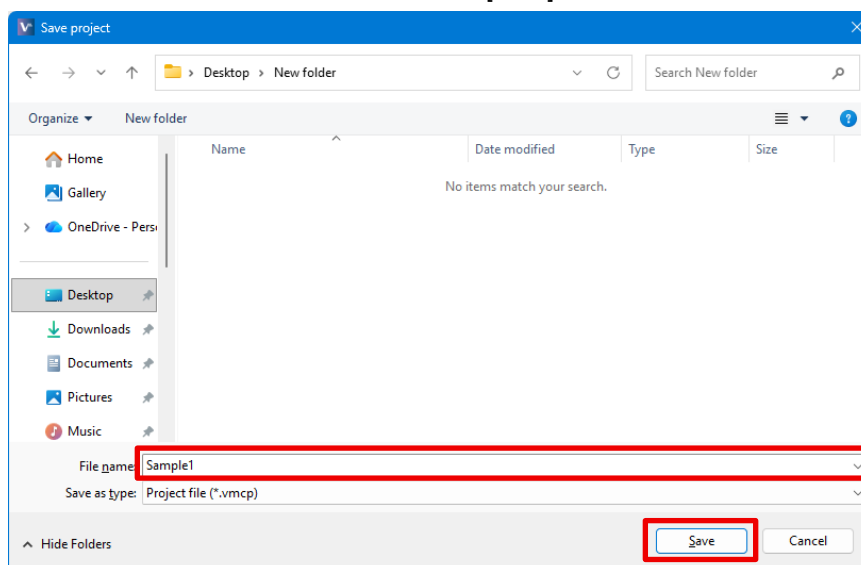
1. Start imaging on each camera and check the imaging status.  
If there is an issue, adjust the cameras and lighting again.



2. In the menu, click [File] → [Save project].



3. Set the desired save destination and file name and click the [Save] button.



The project file (.vmcp) will be saved.

## 4.9. Application to Target Equipment

Apply this solution to the imaging target equipment.

### 4.9.1. Preparing devices

Prepare the devices and software required for connecting the imaging target equipment to this solution.

For details of each device, refer to "3.2 Components".

Device/software/file		Description
Motion module or MELSEC MX Controller		The MELSEC iQ-R series Motion module or MELSEC MX Controller MX-R model which controls the imaging target in existing equipment. It is used as the master station for imaging control in this solution.
Switching HUB <sup>*1</sup>		Used to connect the devices in the existing equipment and devices in this solution.
Personal computer <sup>*2</sup>	GX Works3 <sup>*3</sup>	Used to configure the settings of the master station and create the imaging control program.
	Lighting controller profile	Used to configure the settings of the lighting controller in GX Works3.
Ethernet cable		Used to connect the devices in the existing equipment and devices in this solution.
USB cable		Used to write the settings and programs to the master station in GX Works3.

\*1: This is not required when the devices in the existing equipment and devices in this solution are connected in the line topology.

\*2: The same personal computer as the one that uses MELSOFT VIMA can be used.

\*3: Version 1.123D is used in this guide.

#### (1) Profile for the lighting controller

In this solution, a profile is used to use the lighting controller in the CC-Link IE TSN configuration setting. Download the profile for the lighting controller from the MITSUBISHI ELECTRIC Factory Automation website. [www.MitsubishiElectric.co.jp/fa](http://www.MitsubishiElectric.co.jp/fa)

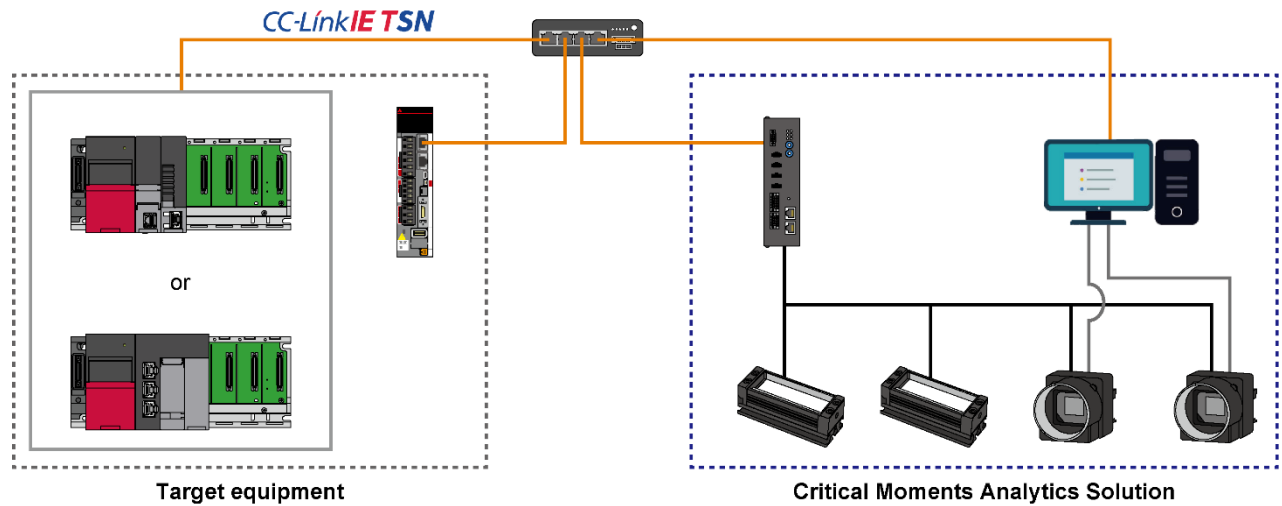
A profile is a setting file that stores the information required for the startup, operation, and maintenance of devices compatible with the CC-Link family. Registering the profile to the engineering tool for the master station adds "LED Lighting Controller" to the "Module List" in the CC-Link IE TSN configuration window. For the procedure for registering the profile, refer to "GX Works3 Operating Manual".

## 4.9.2. Connecting target equipment and solution

Wire the devices in the target equipment and devices in this solution with Ethernet cables, and then connect them to the CC-Link IE TSN network.

The following shows the wiring example when adopting the star topology.

For details and precautions for the network configuration, refer to "3.4 Network Configuration".



## 4.10. Master Station Setting

On GX Works3, configure the settings and create the program for the operation of solution on the master station. Configure the settings and create the program according to the master station model to be used.

### 4.10.1. When using a Motion module

This section describes the setting procedure when a MELSEC iQ-R series Motion module is used as the master station.

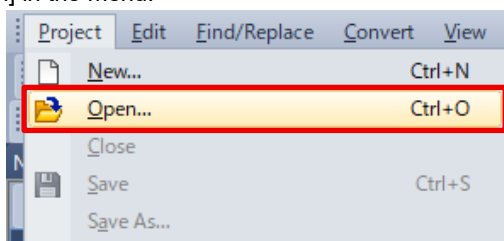
In this section, the lighting controller is set to station number 1 as an example. In addition, "n" in the remote devices shown in this section is a value determined by the station number setting.

(1) Communication mode setting

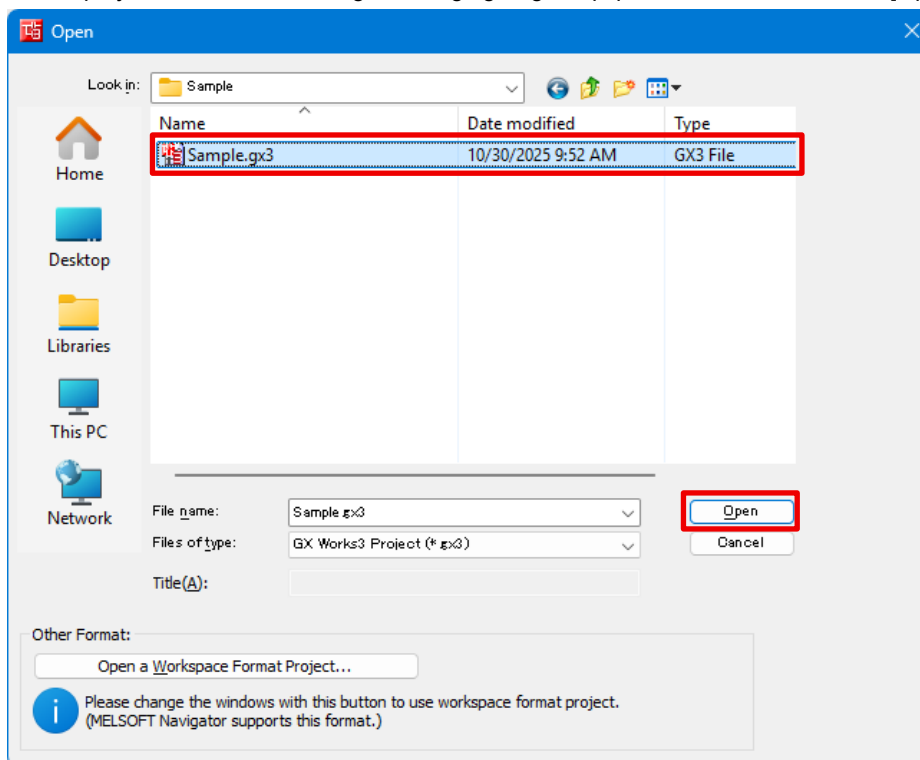
Set the communication mode of the Motion module to be a master station.

For this solution, change the communication mode of the Motion module to "Multicast Mode" to obtain the cyclic data with MELSOFT VIMA.

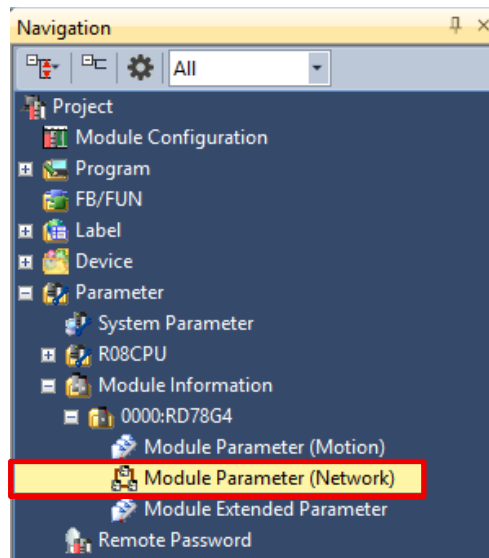
1. Start GX Works3.
2. Click [Project] → [Open] in the menu.



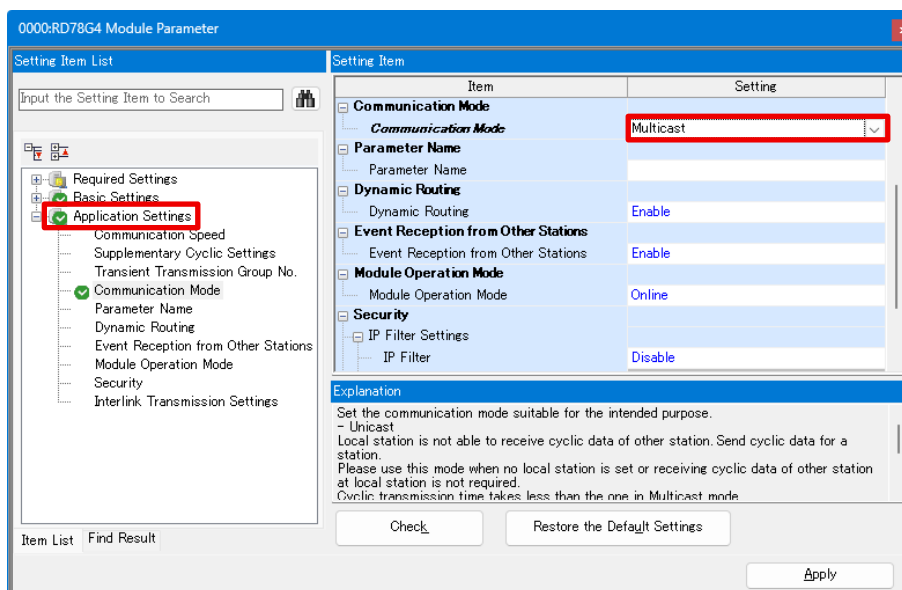
3. Select the project used for controlling the imaging target equipment, and then click the [Open] button.



- In the Navigation window, double-click [Parameter] → [Module Information] → [(Model name of the Motion module)] → [Module Parameter (Network)].



- Click [Application Settings] in the setting item list, and then set [Communication Mode] under [Communication Mode] in the setting items to "Multicast".



**CAUTION**

The cyclic transmission time (communication cycle interval) when the communication mode is "Multicast" is longer than that of when the communication mode is "Unicast".  
For guidelines of the communication cycle interval, refer to the manual of each Motion module.

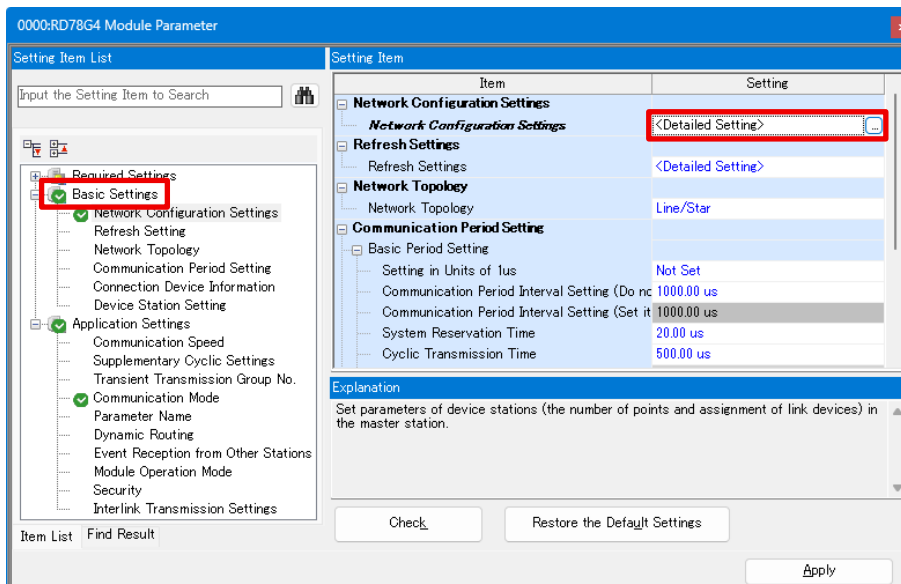
(2) Network configuration setting (adding the lighting controller)

Add the lighting controller to the network configuration of the existing equipment.

In addition, configure the network synchronous communication setting to synchronize the control timing of the motion device and the lighting controller.

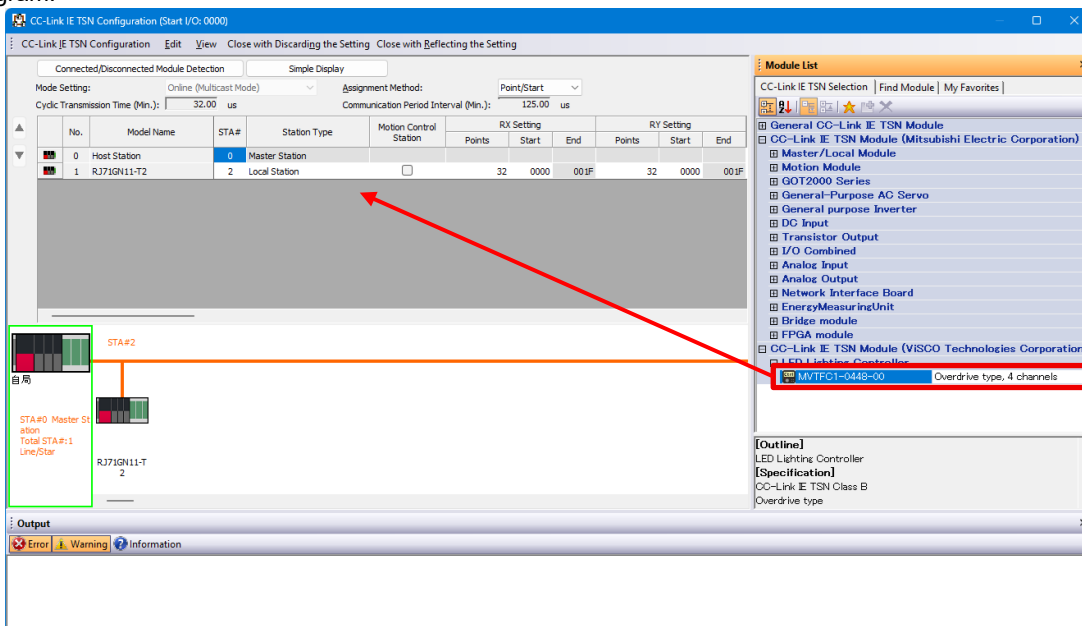
If the profile for the lighting controller is not registered, register it beforehand.

1. Click [Basic Settings] in the setting item list, and then double-click "<Detailed Setting>" of [Network Configuration Settings] under [Network Configuration Settings] in the setting item.

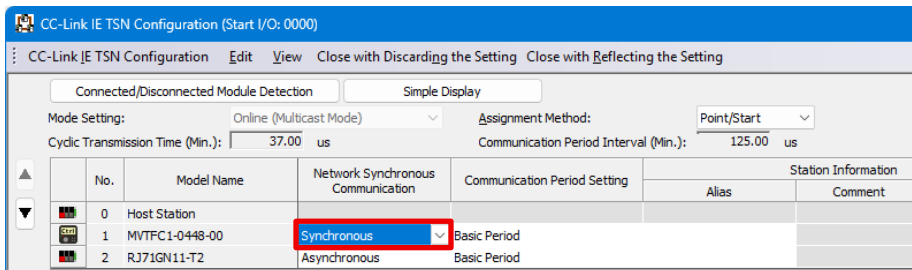


The CC-Link IE TSN configuration window appears.

2. In the module list, select [CC-Link IE TSN Module (ViSCO Technologies Corporation)] → [LED Lighting Controller] → [MVTF01-0448-00], and then drag and drop it to the station list or the network configuration diagram.



3. Set "Network Synchronous Communication" of the added lighting controller to "Synchronous".



**CAUTION**

If there are any devices to synchronize with the lighting controller other than the Motion module, set "Network Synchronous Communication" of the devices to "Synchronous".

4. Set the start number, IP address, or other items of the link devices (RX, RY, RWr, RWw) according to the system.

No.	Model Name	STA#	Station Type	Motion Control Station	RX Setting			RY Setting			RWr Setting			IP Address	Subnet Mask	Default Gateway	Reserved/Error Invalid Station	Network Synchronous Communication	Communication Period Setting
					Points	Start	End	Points	Start	End	Points	Start	End						
0	Host Station	0	Master Station	<input checked="" type="checkbox"/>										192.168.3.253			No Setting	Synchronous	Basic Period
1	MVTF1-0448-00	1	Remote Station	<input checked="" type="checkbox"/>	32	0020	003F	32	0020	003F	16	00	192.168.3.1				No Setting	Synchronous	Basic Period
2	RJ71GN11-T2	2	Local Station	<input type="checkbox"/>	32	0000	003F	32	0000	003F	16	00	192.168.3.111				No Setting	Asynchronous	Basic Period

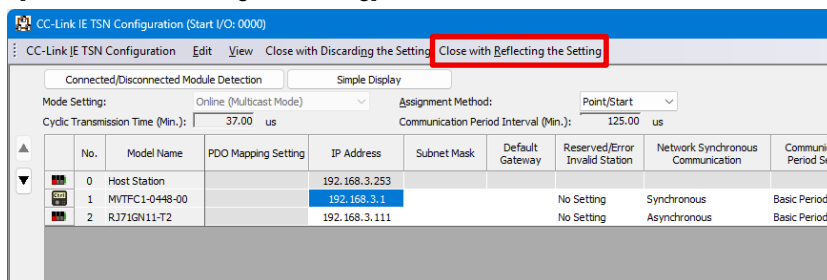
**TIPS**

- Set the IP address of the lighting controller to the same value as the one specified in "4.7 Device Connection Setting".
- If the start number setting for link devices is not displayed, click the [Detailed Display] button to display it.

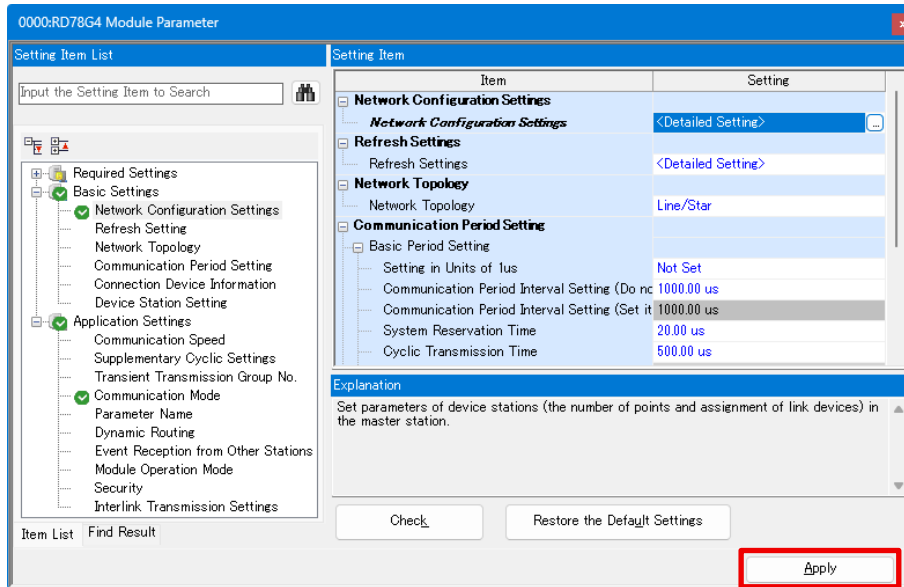
**CAUTION**

Make sure that the "Motion Control Station" check box of the lighting controller is selected. (It is selected by default.)

5. Click the [Close with Reflecting the Setting] button.



6. Click the [Apply] button.



**CAUTION**

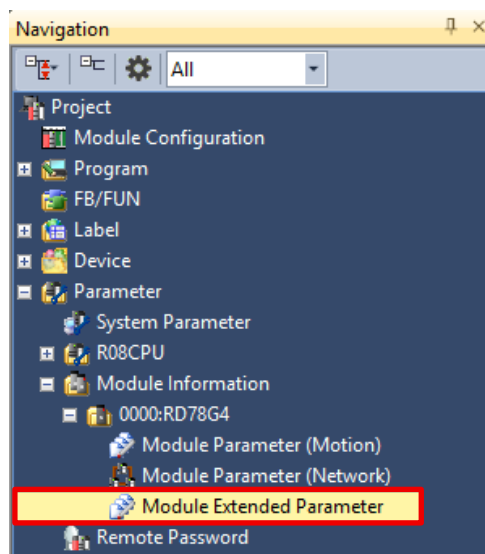
If a switching HUB is added to the system configuration when this solution is introduced, set [TSN HUB Setting] displayed by selecting [Basic Settings] → [Connection Device Information] to "Use TSN HUB" before performing Step 6.

For details, refer to the manual of each Motion module.

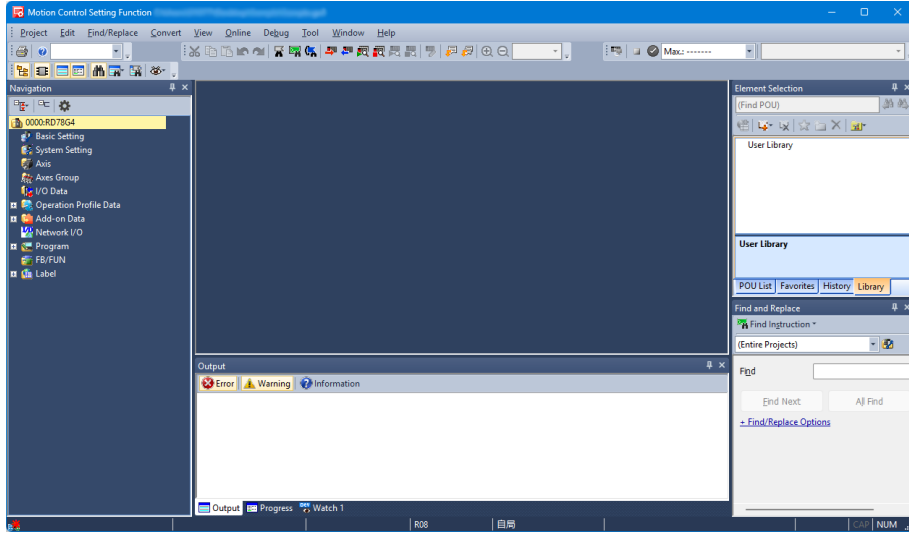
(3) Network I/O setting

To create a program for controlling the CH□ imaging control signals (RYn0 to RYn3), label each remote device of the lighting controller.

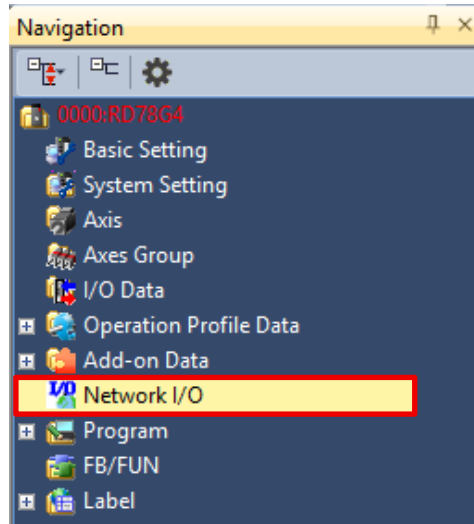
1. In the Navigation window, double-click [Parameter] → [Module Information] → [(Model name of the Motion module)] → [Module Extended Parameter].



The motion control setting function is displayed.



2. In the Navigation window of the motion control setting function, double-click [Network I/O].



3. Select the labeling target check boxes of the following data types of the lighting controller "MVTC1-0448-00".

No.	IP Address	Model Name	Device Label	Data Type	Labeling Target	Data Type	Label Name	Comment
7	192.168.3.1	MVTC1-0448-00	MVTC1_0448_00_001	Entire Device				
				RX0	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX0_	RX0
				RX1	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX1_	RX1
				RX2	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX2_	RX2
				RX3	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX3_	RX3
				RX4	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX4_	RX4
				RX5	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX5_	RX5
				RX6	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX6_	RX6
				RX7	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX7_	RX7
				RX8	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX8_	RX8
				RX9	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX9_	RX9
				RX10	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX10_	RX10
				RX11	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX11_	RX11
				RX1F	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RX1F_	RX1F
				RY0	<input checked="" type="checkbox"/>	Bit	MVTC1_0448_00_001_Imagine_Control_Signal_CH1	Imagine Control Signal CH1
				RY1	<input checked="" type="checkbox"/>	Bit	MVTC1_0448_00_001_Imagine_Control_Signal_CH2	Imagine Control Signal CH2
				RY2	<input checked="" type="checkbox"/>	Bit	MVTC1_0448_00_001_Imagine_Control_Signal_CH3	Imagine Control Signal CH3
				RY3	<input checked="" type="checkbox"/>	Bit	MVTC1_0448_00_001_Imagine_Control_Signal_CH4	Imagine Control Signal CH4
				RY4	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RY4_	RY4
				RY5	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RY5_	RY5
				RY6	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RY6_	RY6
				RY7	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RY7_	RY7
				RY8	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RY8_	RY8
				RY9	<input type="checkbox"/>	Bit	MVTC1_0448_00_001_RY9_	RY9
				RW0	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW0_	RW0
				RW1	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW1_	RW1
				RW2	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW2_	RW2
				RW3	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW3_	RW3
				RW4	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW4_	RW4
				RW5	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW5_	RW5
				RW6	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW6_	RW6
				RW7	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW7_	RW7
				RW8	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW8_	RW8
				RW9	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW9_	RW9
				RW10	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW10_	RW10
				RW11	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW11_	RW11
				RW12	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW12_	RW12
				RW13	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW13_	RW13
				RW14	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW14_	RW14
				RW15	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW15_	RW15
				RW16	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW16_	RW16
				RW17	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW17_	RW17
				RW18	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW18_	RW18
				RW19	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW19_	RW19
				RW20	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW20_	RW20
				RW21	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW21_	RW21
				RW22	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW22_	RW22
				RW23	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW23_	RW23
				RW24	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW24_	RW24
				RW25	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW25_	RW25
				RW26	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW26_	RW26
				RW27	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW27_	RW27
				RW28	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW28_	RW28
				RW29	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW29_	RW29
				RW30	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW30_	RW30
				RW31	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW31_	RW31
				RW32	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW32_	RW32
				RW33	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW33_	RW33
				RW34	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW34_	RW34
				RW35	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW35_	RW35
				RW36	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW36_	RW36
				RW37	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW37_	RW37
				RW38	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW38_	RW38
				RW39	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW39_	RW39
				RW40	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW40_	RW40
				RW41	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW41_	RW41
				RW42	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW42_	RW42
				RW43	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW43_	RW43
				RW44	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW44_	RW44
				RW45	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW45_	RW45
				RW46	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW46_	RW46
				RW47	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW47_	RW47
				RW48	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW48_	RW48
				RW49	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW49_	RW49
				RW50	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW50_	RW50
				RW51	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW51_	RW51
				RW52	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW52_	RW52
				RW53	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW53_	RW53
				RW54	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW54_	RW54
				RW55	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW55_	RW55
				RW56	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW56_	RW56
				RW57	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW57_	RW57
				RW58	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW58_	RW58
				RW59	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW59_	RW59
				RW60	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW60_	RW60
				RW61	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW61_	RW61
				RW62	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW62_	RW62
				RW63	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW63_	RW63
				RW64	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW64_	RW64
				RW65	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW65_	RW65
				RW66	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW66_	RW66
				RW67	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW67_	RW67
				RW68	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW68_	RW68
				RW69	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW69_	RW69
				RW70	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW70_	RW70
				RW71	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW71_	RW71
				RW72	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW72_	RW72
				RW73	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW73_	RW73
				RW74	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW74_	RW74
				RW75	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW75_	RW75
				RW76	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW76_	RW76
				RW77	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW77_	RW77
				RW78	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW78_	RW78
				RW79	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW79_	RW79
				RW80	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW80_	RW80
				RW81	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW81_	RW81
				RW82	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW82_	RW82
				RW83	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW83_	RW83
				RW84	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW84_	RW84
				RW85	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW85_	RW85
				RW86	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW86_	RW86
				RW87	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW87_	RW87
				RW88	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW88_	RW88
				RW89	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW89_	RW89
				RW90	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW90_	RW90
				RW91	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW91_	RW91
				RW92	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW92_	RW92
				RW93	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW93_	RW93
				RW94	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW94_	RW94
				RW95	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW95_	RW95
				RW96	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW96_	RW96
				RW97	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW97_	RW97
				RW98	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW98_	RW98
				RW99	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW99_	RW99
				RW100	<input type="checkbox"/>	Word (Signed)	MVTC1_0448_00_001_RW100_	RW100

**Explanation**  
Registers the I/O data for cyclic communication between the motion module and the device stations under its management, as labels.  
Executing 'Create Label' registers only 'Labeling Target' data to the global label list (NW-Global).  
After executing 'Create Label', you are unable to restore the label registration data before creation.  
Contents edited in this window are not saved in the project and are only kept while the project is open.  
After the project is re-opened, the label registration data on the global label list (NW-Global) will be reflected in the displayed data.

Update Network Configuration Info    Create Label

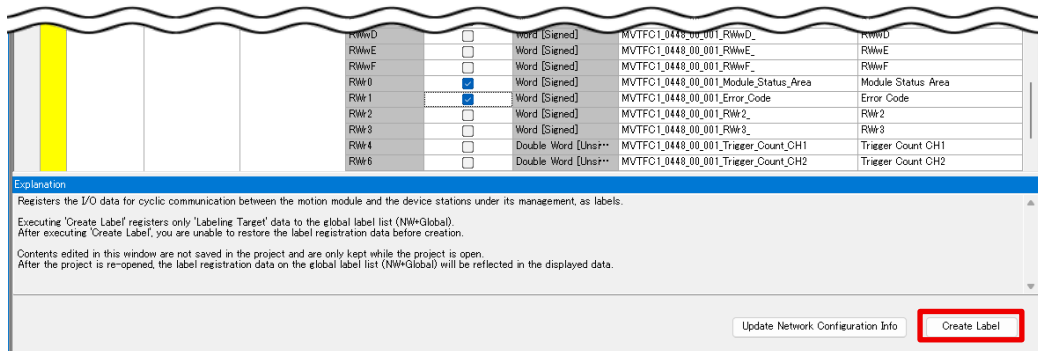
Data type	Description	Created label*1
RYn0	CH1 imaging control signal	MVTF01_0448_00_001_Imaging_Control_Signal_CH1
RYn1	CH2 imaging control signal	MVTF01_0448_00_001_Imaging_Control_Signal_CH2
RYn2	CH3 imaging control signal	MVTF01_0448_00_001_Imaging_Control_Signal_CH3
RYn3	CH4 imaging control signal	MVTF01_0448_00_001_Imaging_Control_Signal_CH4
RWrn0	Module status area	MVTF01_0448_00_001_Module_Status_Area
RWrn1	Error code	MVTF01_0448_00_001_Error_Code

\*1: The names of the created labels differ depending on the setting. The names listed in this table are examples of the default setting.

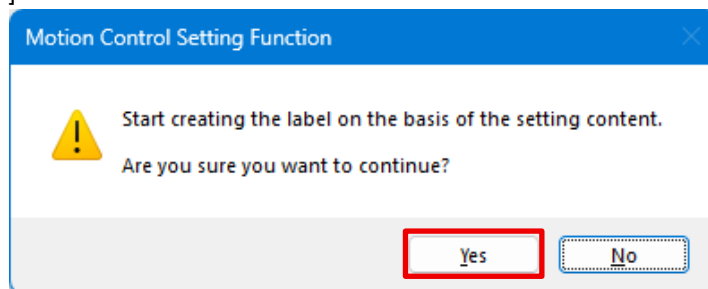
 **TIPS**

In the example shown in this guide, the following remote devices are labeled: RYn0 to RYn3 and RWrn0 which are required for creating the imaging control program and RWrn1 which indicates the error code of the lighting controller.  
For details on each remote device of the lighting controller, refer to the manual of the lighting controller.

4. Click the [Create Label] button.



5. Click the [Yes] button.



The global labels of the remote devices selected in Step 3 are created in [Label] → [Global Label] → [NW+Global1] in the Navigation window.

(4) Creating the imaging control program

Create the imaging control program for controlling the CH□ imaging control signals (RYn0 to RYn3).

**CAUTION**

Write the code of the imaging control program in the motion control program or the sequence program. The imaging control program must be executed according to the communication cycle interval of the Motion module. Therefore, write the code in a program which can be executed at the communication cycle interval of the Motion module.

The minimum setting values for the execution cycle of each program are as follows.

- Motion control program: 62.5 [μs]
- Sequence program: 500.0 [μs]

(a) When creating code with the motion control program

The following describes the procedure for writing code of the imaging control program in the motion control program.

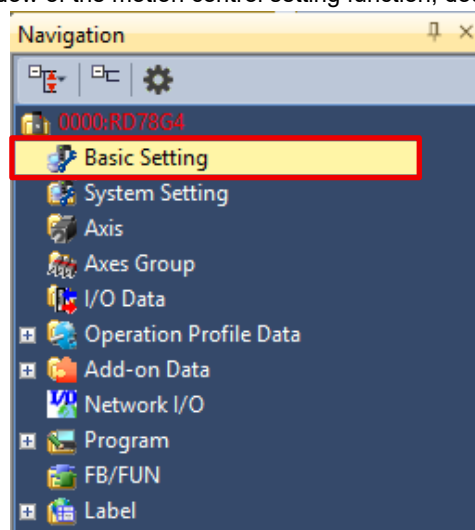
■ Setting the fixed scan interval

Code of the imaging control program must be written in a periodic execution type program. The execution cycle of the program must match the communication cycle interval of the Motion module. The following describes the procedure for setting the fixed scan interval of the periodic execution type program.

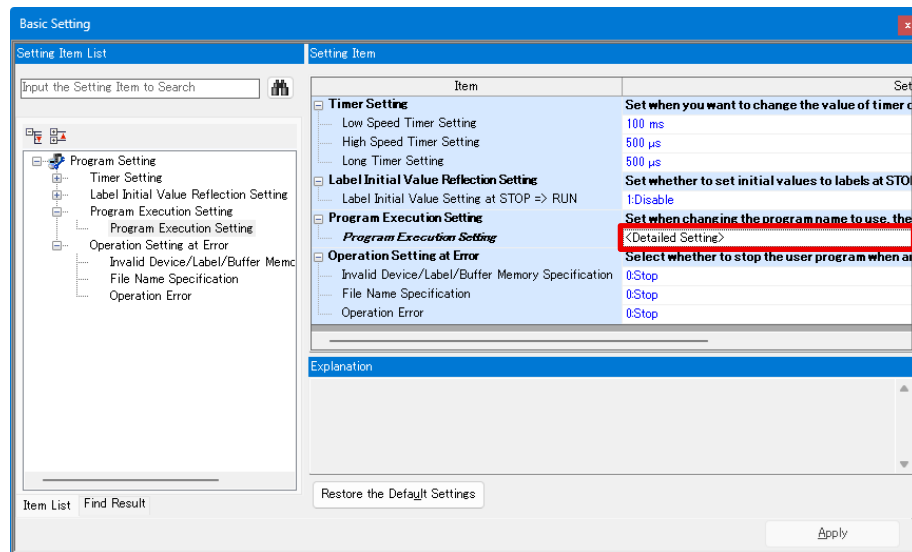
**CAUTION**

If the corresponding periodic execution type program does not exist in the existing project, create a new periodic execution type program. For creating a new periodic execution type program, refer to "GX Works3 Operating Manual".

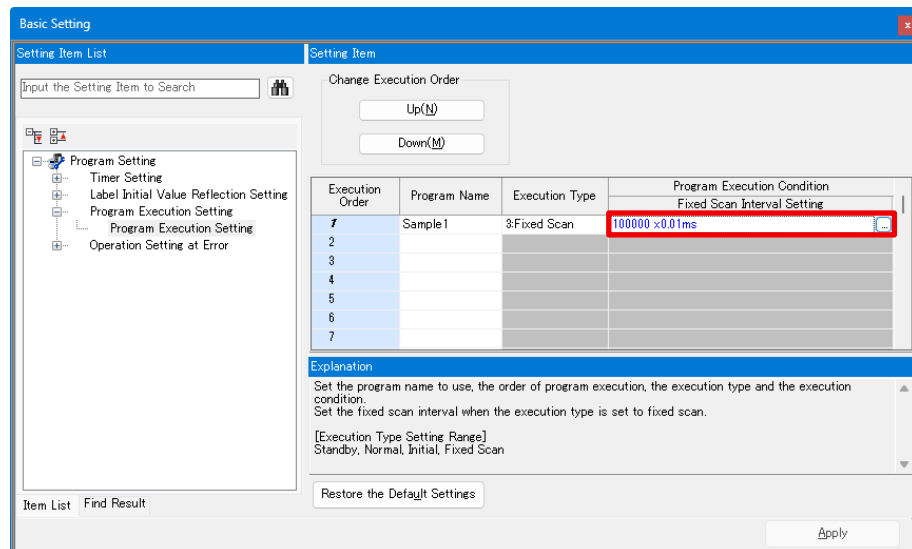
1. In the Navigation window of the motion control setting function, double-click [Basic Setting].



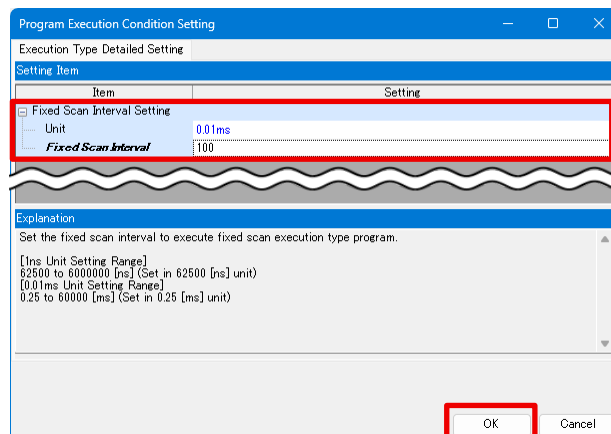
2. Double-click "<Detailed Setting>" of [Program Execution Setting] under [Program Execution Setting].



3. Double-click "Fixed Scan Interval Setting" of the program to be used for the imaging control.



4. Set the fixed scan interval to the same value as the communication cycle interval of the Motion module, and then click the [OK] button.

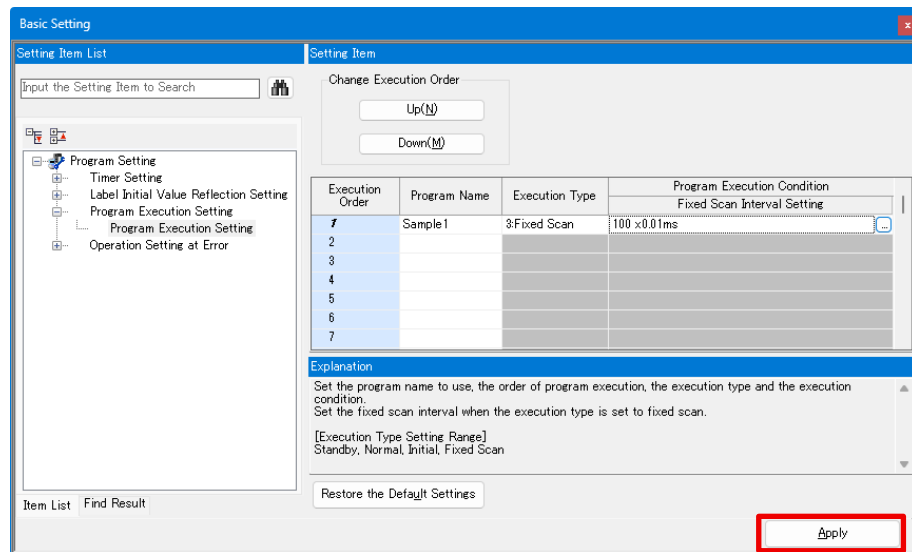


 TIPS

The communication cycle interval of the Motion module can be checked by following the steps below.

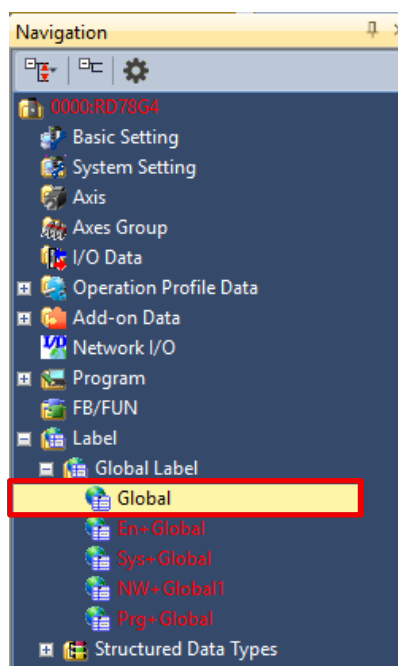
1. In the Navigation window of GX Works3, double-click [Parameter] → [Module Information] → [(Model name of the Motion module)] → [Module Parameter (Network)].
2. Check the communication cycle interval set in [Communication Period Interval Setting (Do not Set it in Units of 1us)] or [Communication Period Interval Setting (Set it in Units of 1us)] under [Basic Period Setting] displayed by selecting [Basic Settings] → [Communication Period Setting].

5. Click the [Apply] button.



■ Writing code of the imaging control program

1. In the Navigation window of the motion control setting function, double-click [Label] → [Global Label] → [Global].



2. Create the following global label to be used as the trigger of the imaging control.
  - Label name: bImageCaptureTrig
  - Data type: Bit (0..3)
  - Class: VAR\_GLOBAL

	Label Name	Data Type	Class	Initial Value	Constant	English(Display Target)
1	bImageCaptureTrig	Bit(0..3)	VAR_GLOBAL			Imaging control signal trigger
2						

3. Open the program to be used from [Program] → [Fixed Scan] in the Navigation window, and then write the following code.

```

1  /* Turn on bImageCaptureTrig [0] to [3] to start imaging. */
2
3
4
5
6
7  IF MVTFC1_0448_00_001_Module_Status_Area.1 THEN
8  /* When the trigger Ready is ON, set CH□ imaging control signal (RYn0 to RYn3). */
9  MVTFC1_0448_00_001_Imaging_Control_Signal_CH1 := bImageCaptureTrig[0] ;
10 MVTFC1_0448_00_001_Imaging_Control_Signal_CH2 := bImageCaptureTrig[1] ;
11 MVTFC1_0448_00_001_Imaging_Control_Signal_CH3 := bImageCaptureTrig[2] ;
12 MVTFC1_0448_00_001_Imaging_Control_Signal_CH4 := bImageCaptureTrig[3] ;
13
14 ELSE
15 /* When the trigger Ready is OFF, set CH□ imaging control signal (RYn0 to RYn3) to OFF. */
16 MVTFC1_0448_00_001_Imaging_Control_Signal_CH1 := FALSE ;
17 MVTFC1_0448_00_001_Imaging_Control_Signal_CH2 := FALSE ;
18 MVTFC1_0448_00_001_Imaging_Control_Signal_CH3 := FALSE ;
19 MVTFC1_0448_00_001_Imaging_Control_Signal_CH4 := FALSE ;
20 END_IF;

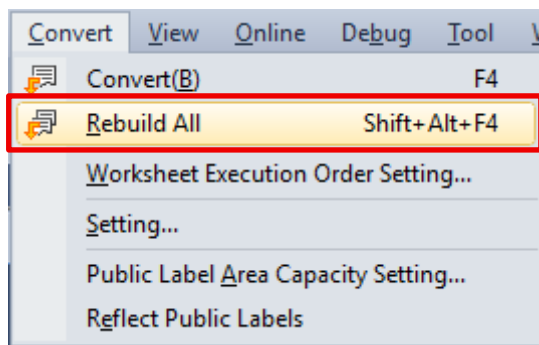
```

No.	Process description
(1)	Turn on the imaging control signal trigger "bImageCaptureTrig" to perform imaging. Write the desired timing.
(2)	When the trigger Ready (b1) of the module status area (RWrn0) of the lighting controller is ON, set the imaging control signal trigger "bImageCaptureTrig" for the CH□ imaging control signals (RYn0 to RYn3).
(3)	When the trigger Ready (b1) of the module condition area (RWrn0) of the lighting controller is OFF, turn off the CH□ imaging control signals (RYn0 to RYn3).

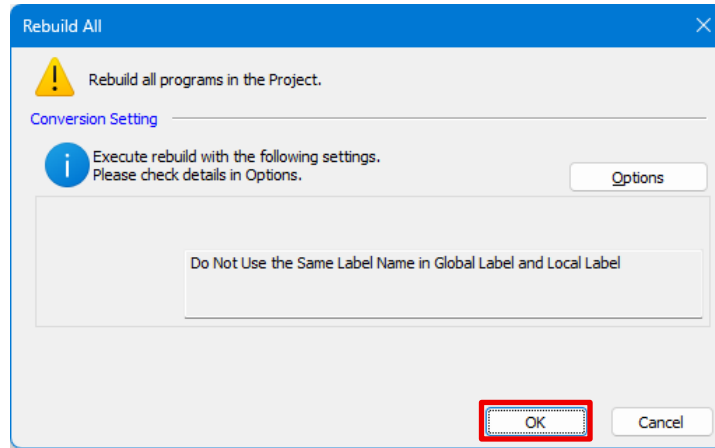
**CAUTION**

Interruptions must be enabled by the EI instruction to execute the imaging control program in a periodic execution type program. Add the process to execute the EI instruction to a program other than the imaging control program.

4. In the menu of the motion control setting function, click [Convert] → [Rebuild All].



5. Click the [OK] button.



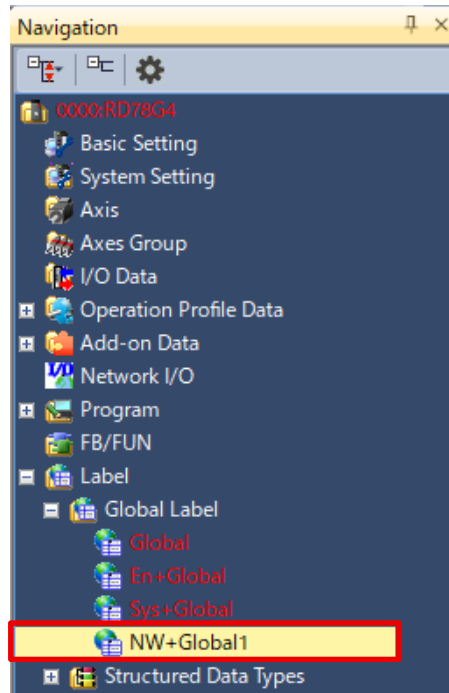
- (b) When creating code with the motion control program

The following describes the procedure for writing code of the imaging control program in the sequence program.

■ Public label setting

When writing code of the imaging control program in the sequence program, make the labels of the lighting controller created in "4.10.1(3) Network I/O setting" public to the CPU module side.

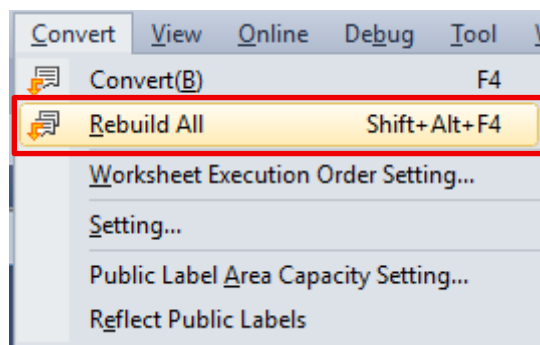
1. In the Navigation window of the motion control setting function, double-click [Label] → [Global Label] → [NW+Global1].



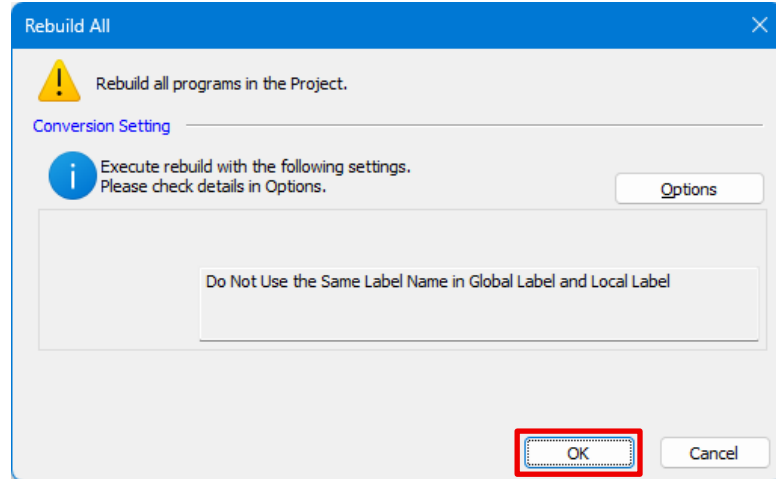
2. Set the public label column for the global labels of the lighting controller to "Enabled".

Label Name	Data Type	Class	Initial Value	Constant	English(Display Target)	Remark	Public Label	Motion Control Attribute
MVTF01_0448_00_001_Imaging_Control_Signal_CH1	Bit	VAR_GLOBAL			Imaging Control Signal CH1		Enabled	WRITE (-> Motion) RY
MVTF01_0448_00_001_Imaging_Control_Signal_CH2	Bit	VAR_GLOBAL			Imaging Control Signal CH2		Enabled	WRITE (-> Motion) RY
MVTF01_0448_00_001_Imaging_Control_Signal_CH3	Bit	VAR_GLOBAL			Imaging Control Signal CH3		Enabled	WRITE (-> Motion) RY
MVTF01_0448_00_001_Imaging_Control_Signal_CH4	Bit	VAR_GLOBAL			Imaging Control Signal CH4		Enabled	WRITE (-> Motion) RY
MVTF01_0448_00_001_Module_Status_Area	Word (Stenrd)	VAR_GLOBAL			Module Status Area		Enabled	READ (Motion =>) RYW
MVTF01_0448_00_001_Error_Code	Word (Stenrd)	VAR_GLOBAL			Error Code		Enabled	READ (Motion =>) RYW

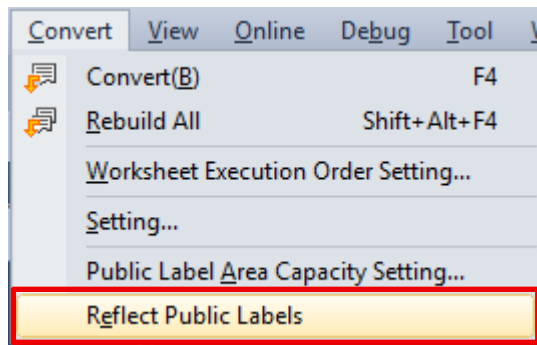
3. Click [Convert] → [Rebuild All] in the menu.



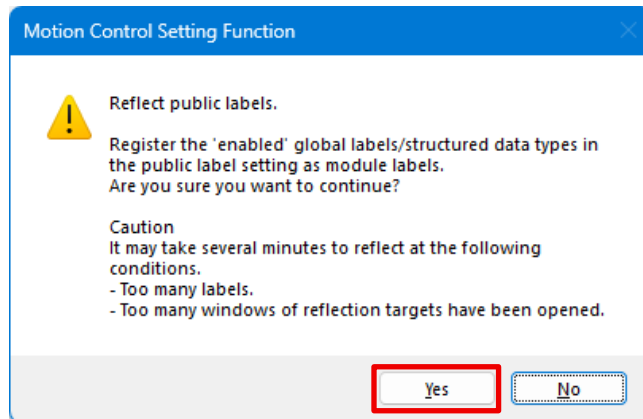
4. Click the [OK] button.



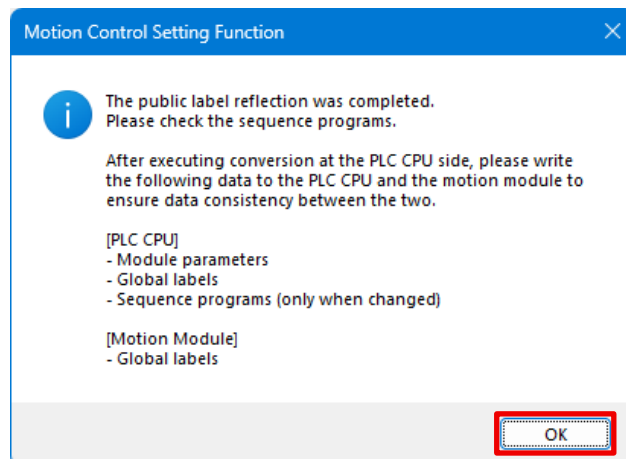
5. Click [Convert] → [Reflect Public Labels] in the menu.



6. Click the [Yes] button.



7. Click the [OK] button.



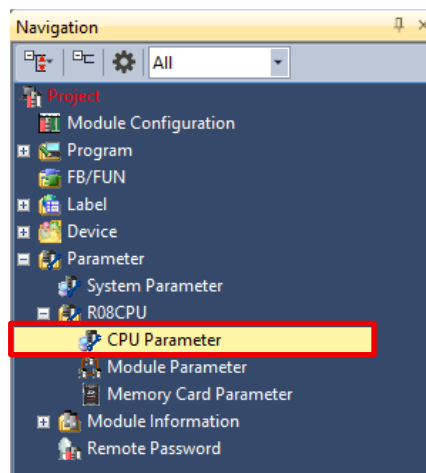
■ Setting the fixed scan interval

Code of the imaging control program must be written in a periodic execution type program. The execution cycle of the program must match the communication cycle interval of the Motion module. The following describes the procedure for setting the fixed scan interval of the periodic execution type program.

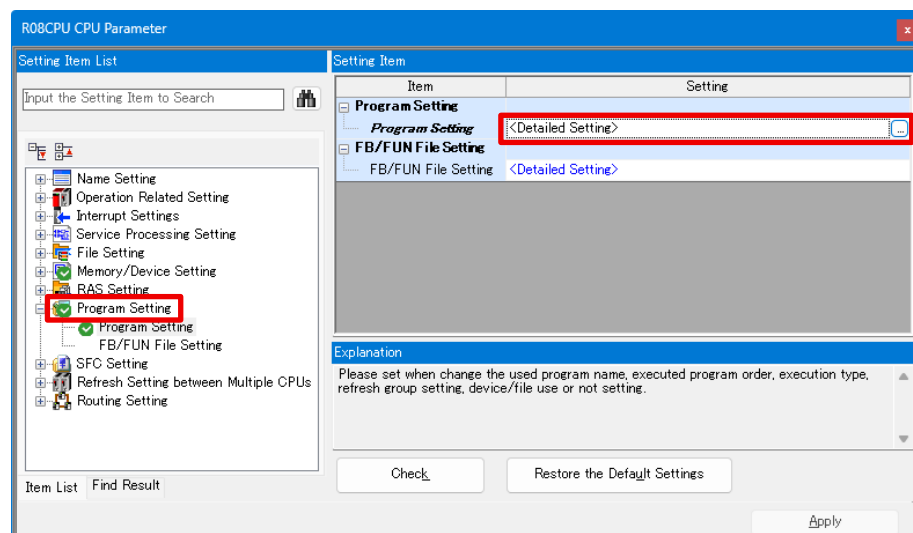
⚠ CAUTION

If the corresponding periodic execution type program does not exist in the existing project, create a new periodic execution type program. For creating a new periodic execution type program, refer to "GX Works3 Operating Manual".

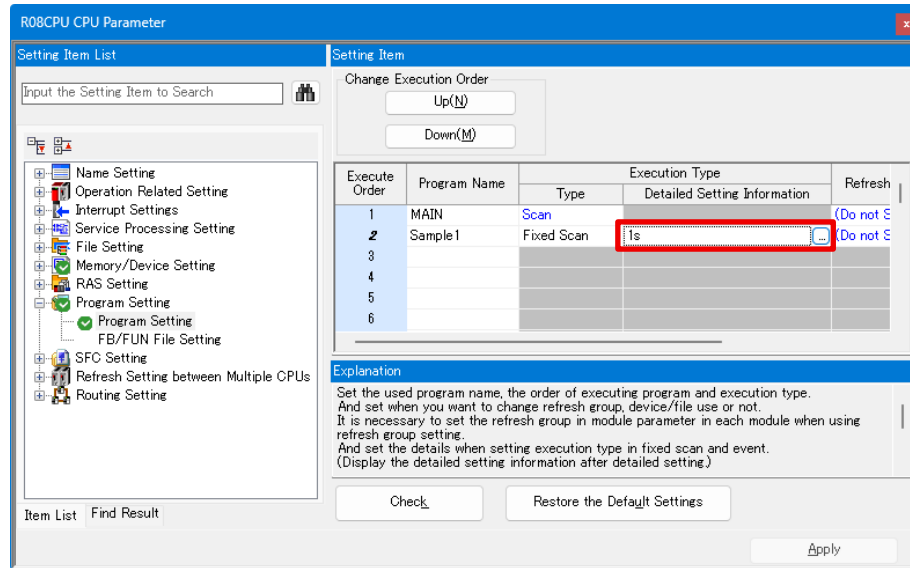
1. In the Navigation window of GX Works3, double-click [Parameter] → [(CPU module name)] → [CPU Parameter].



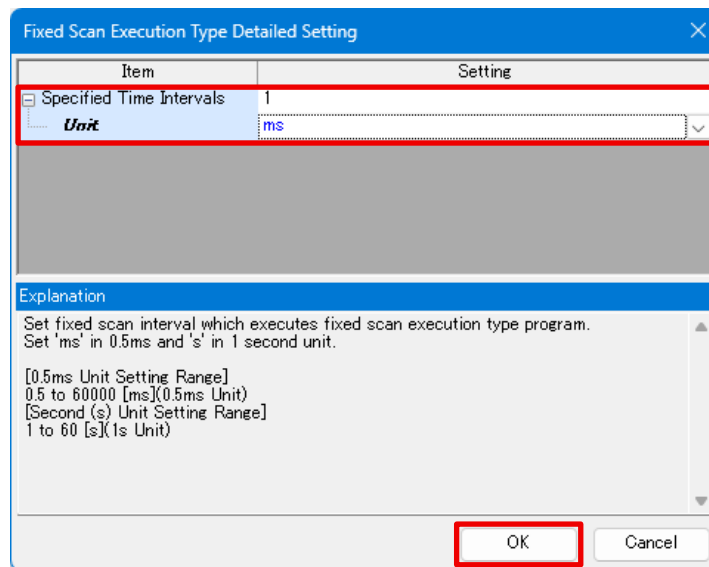
2. Click [Program Setting] in the setting item list, and then double-click "<Detailed Setting>" of [Program Setting] under [Program Setting] in the setting item.



3. Double-click "Detailed Setting Information" of the program to be used for the imaging control.



4. Set the fixed scan interval to the same value as the communication cycle interval of the Motion module, and then click the [OK] button.

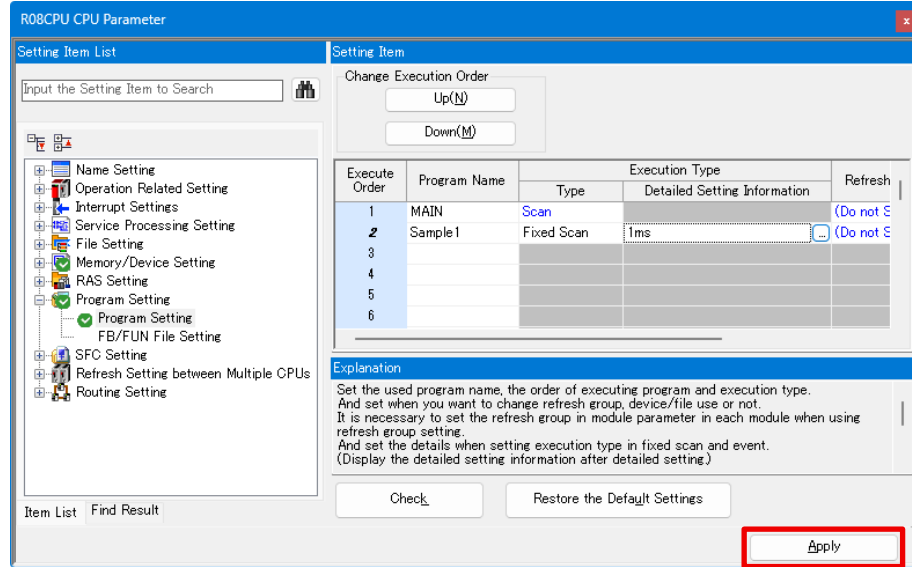


TIPS

The communication cycle interval of the Motion module can be checked by following the steps below.

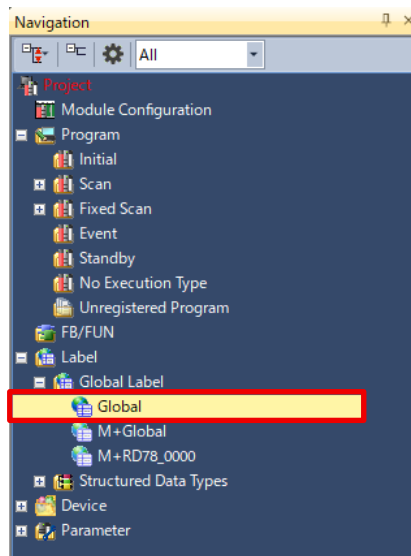
1. In the Navigation window of GX Works3, double-click [Parameter] → [Module Information] → [(Model name of the Motion module)] → [Module Parameter (Network)].
2. Check the communication cycle interval set in [Communication Period Interval Setting (Do not Set it in Units of 1us)] or [Communication Period Interval Setting (Set it in Units of 1us)] under [Basic Period Setting] displayed by selecting [Basic Settings] → [Communication Period Setting].

5. Click the [Apply] button.



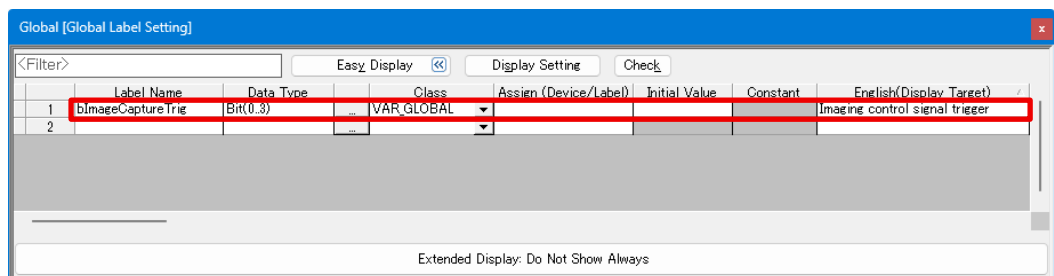
■ Writing code of the imaging control program

1. In the Navigation window of GX Works3, double-click [Label] → [Global Label] → [Global].



2. Create the following global label to be used as the trigger of the imaging control.

- Label name: bImageCaptureTrig
- Data type: Bit (0..3)
- Class: VAR\_GLOBAL



3. Open the program to be used from [Program] → [Fixed Scan] in the Navigation window, and then write the following code.

```

(1) 1  /* Turn on bImageCaptureTrig [0] to [3] to start imaging. */
    2
    3
    4
    5
    6
(2) 7 IF RD78_0000.MVTFC1_0448_00_001_Module_Status_Area.1 THEN
    8 /* When the trigger Ready is ON, set CH□ imaging control signal (RYn0 to RYn3). */
    9 RD78_0000.MVTFC1_0448_00_001_Imaging_Control_Signal_CH1 := bImageCaptureTrig[0] ;
   10 RD78_0000.MVTFC1_0448_00_001_Imaging_Control_Signal_CH2 := bImageCaptureTrig[1] ;
   11 RD78_0000.MVTFC1_0448_00_001_Imaging_Control_Signal_CH3 := bImageCaptureTrig[2] ;
   12 RD78_0000.MVTFC1_0448_00_001_Imaging_Control_Signal_CH4 := bImageCaptureTrig[3] ;
   13
(3) 14 ELSE
   15 /* When the trigger Ready is OFF, set CH□ imaging control signal (RYn0 to RYn3) to OFF. */
   16 RD78_0000.MVTFC1_0448_00_001_Imaging_Control_Signal_CH1 := FALSE ;
   17 RD78_0000.MVTFC1_0448_00_001_Imaging_Control_Signal_CH2 := FALSE ;
   18 RD78_0000.MVTFC1_0448_00_001_Imaging_Control_Signal_CH3 := FALSE ;
   19 RD78_0000.MVTFC1_0448_00_001_Imaging_Control_Signal_CH4 := FALSE ;
   20 END_IF;

```

No.	Process description
(1)	Turn on the imaging control signal trigger "bImageCaptureTrig" to perform imaging. Write the desired timing.
(2)	When the trigger Ready (b1) of the module status area (RWrm0) of the lighting controller is ON, set the imaging control signal trigger "bImageCaptureTrig" for the CH□ imaging control signals (RYn0 to RYn3).
(3)	When the trigger Ready (b1) of the module condition area (RWrm0) of the lighting controller is OFF, turn off the CH□ imaging control signals (RYn0 to RYn3).

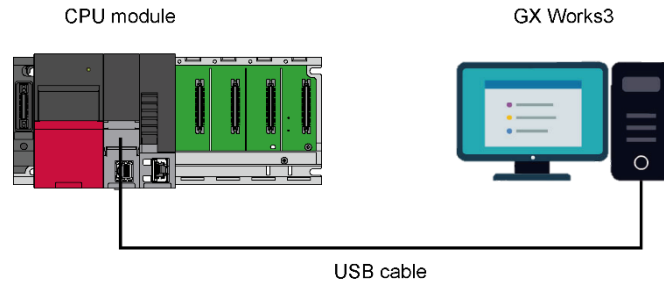
**⚠ CAUTION**

Interruptions must be enabled by the EI instruction to execute the imaging control program in a periodic execution type program. Add the process to execute the EI instruction to a program other than the imaging control program.

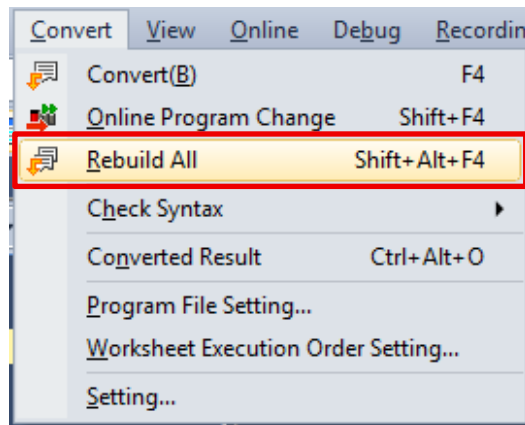
(5) Writing to the programmable controller

Write the configured settings to the programmable controller.

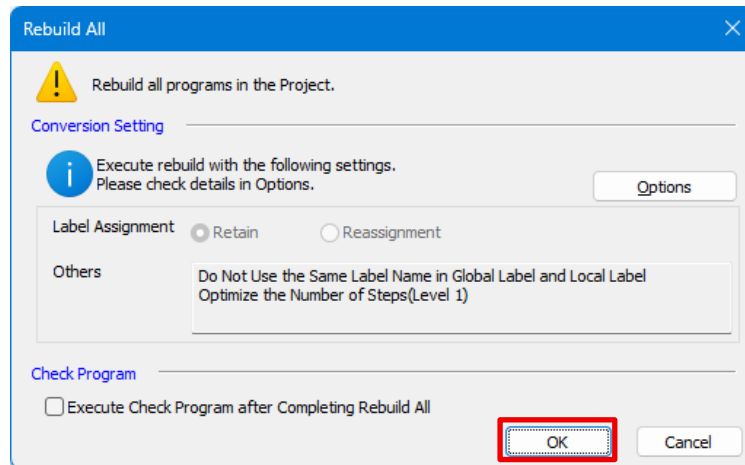
1. Connect the CPU module to GX Works3 with a USB cable.



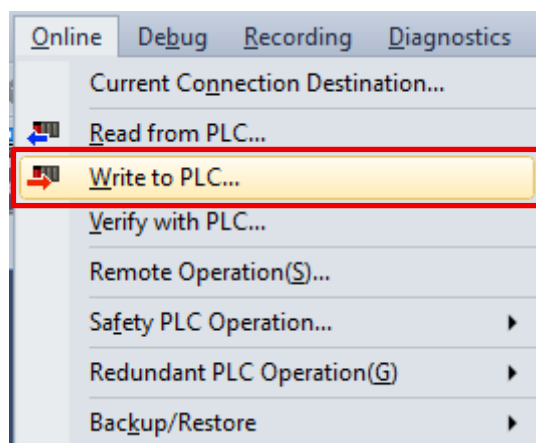
2. In the menu of GX Works3, click [Convert] → [Rebuild All].



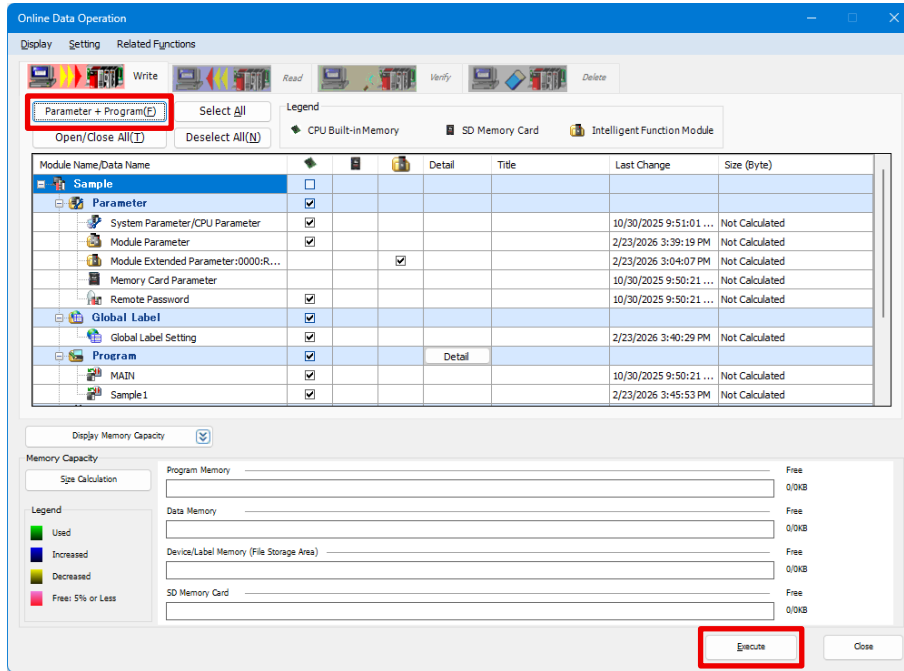
3. Click the [OK] button. All the programs will be rebuilt.



4. Click [Online] → [Write to PLC] in the menu.



5. Click the [Parameter + Program] button, and then click the [Execute] button.



The data will be written.

6. After the data is written, reset the CPU module and change the status from STOP to RUN.

### 4.10.2. When using a MELSEC MX Controller

This section describes the setting procedure when a MELSEC MX Controller MX-R model is used as the master station.

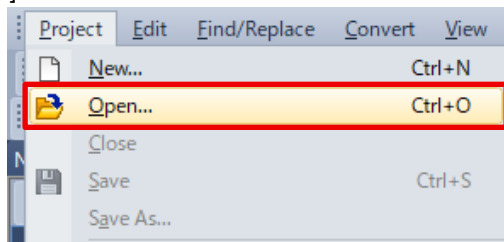
In this section, the lighting controller is set to station number 1 as an example. In addition, "n" in the remote devices shown in this section is a value determined by the station number setting.

(1) Communication mode setting

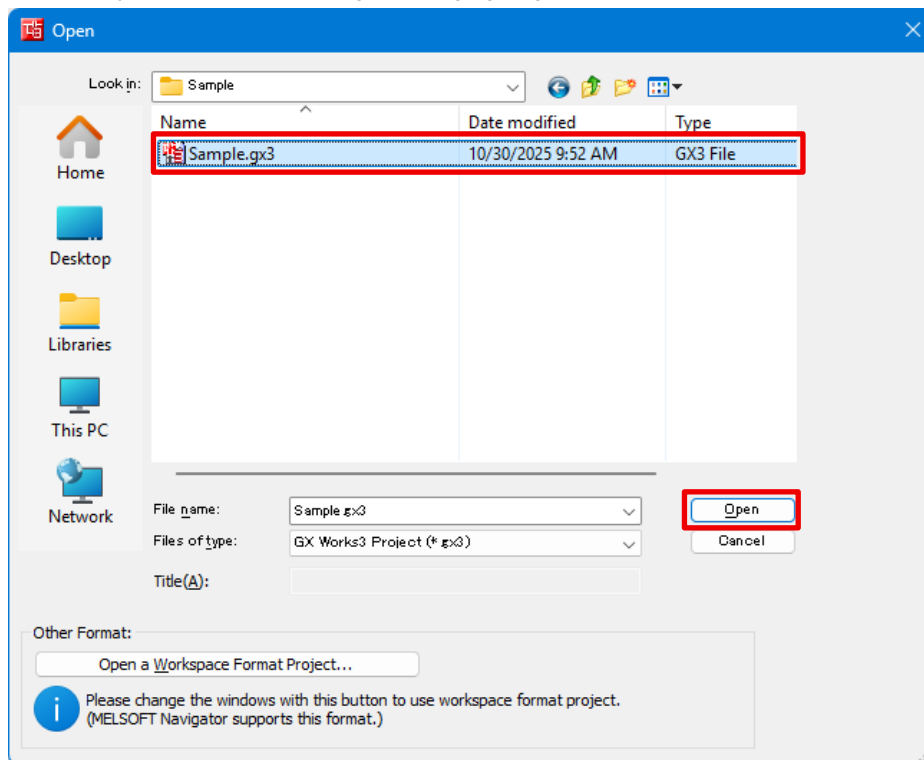
Set the communication mode of the MELSEC MX Controller.

For this solution, change the communication mode of the MELSEC MX Controller to "Multicast Mode" to obtain the cyclic data with MELSOFT VIMA.

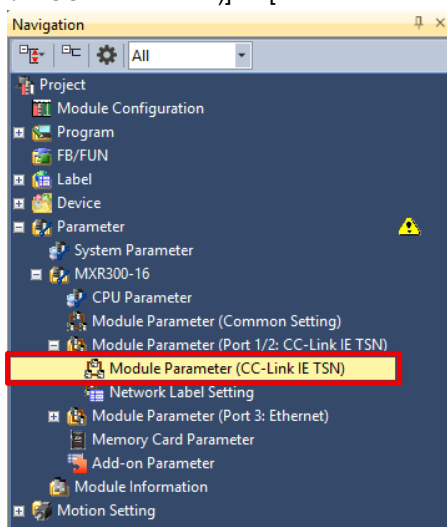
1. Start GX Works3.
2. Click [Project] → [Open] in the menu.



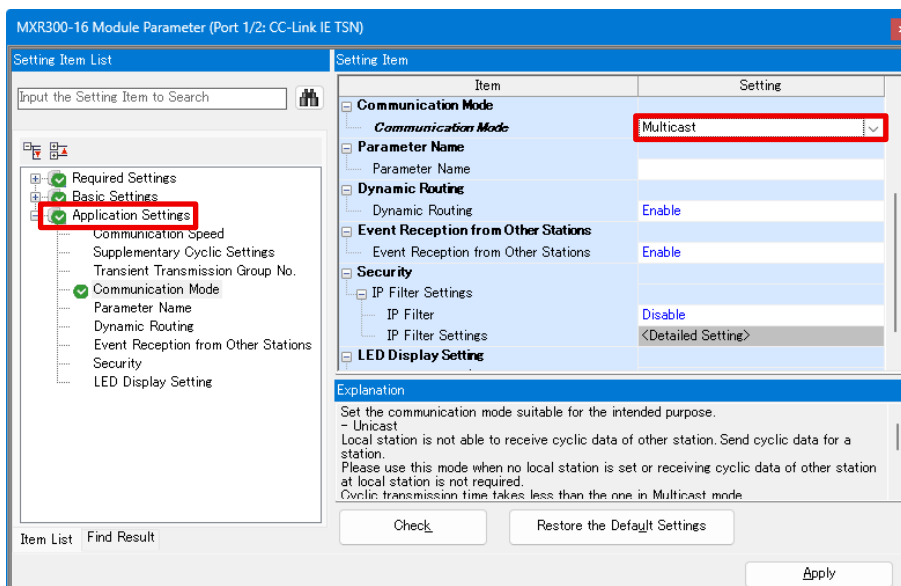
3. Select the project used for controlling the imaging target equipment, and then click the [Open] button.



- In the Navigation window, double-click [Parameter] → [(Model name of the MELSEC MX Controller)] → [Module Parameter (Port 1/2: CC-Link IE TSN)] → [Module Parameter (CC-Link IE TSN)].



- Click [Application Settings] in the setting item list, and then set [Communication Mode] under [Communication Mode] in the setting items to "Multicast".



**CAUTION**

The cyclic transmission time (communication cycle interval) when the communication mode is "Multicast" is longer than that of when the communication mode is "Unicast".  
For guidelines of the communication cycle interval, refer to the manual of each MELSEC MX Controller.

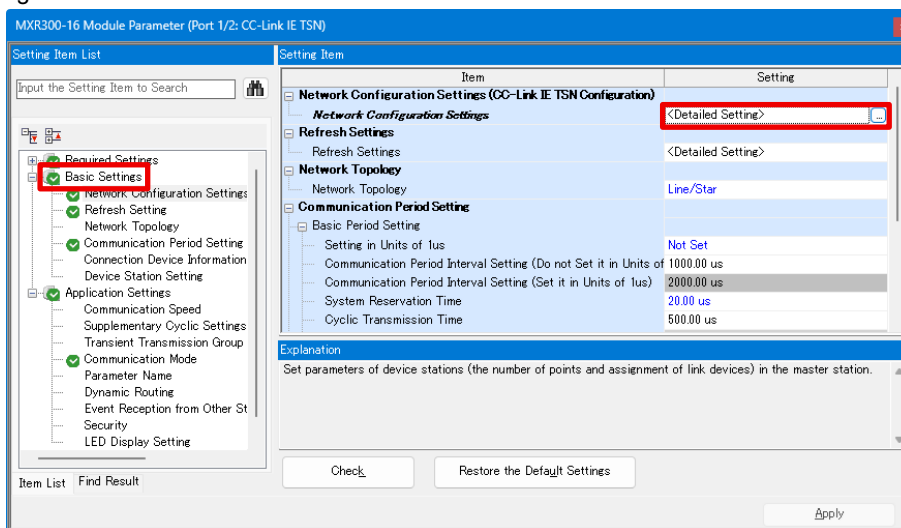
(2) Network configuration setting (adding the lighting controller)

Add the lighting controller to the network configuration of the existing equipment.

In addition, configure the network synchronous communication setting to synchronize the control timing of the motion device and the lighting controller.

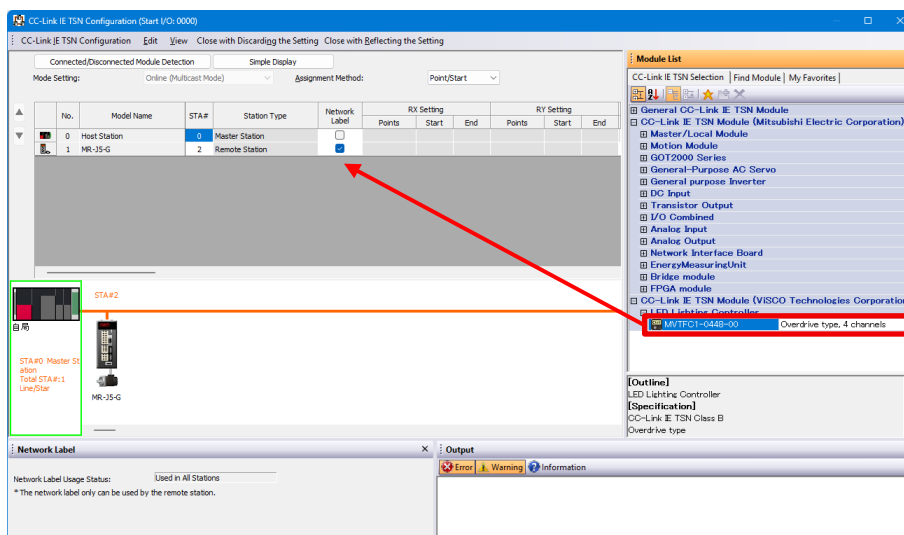
If the profile for the lighting controller is not registered, register it beforehand.

1. Click [Basic Settings] in the setting item list, and then double-click "<Detailed Setting>" of [Network Configuration Settings] under [Network Configuration Settings (CC-Link IE TSN Configuration)] in the setting item.

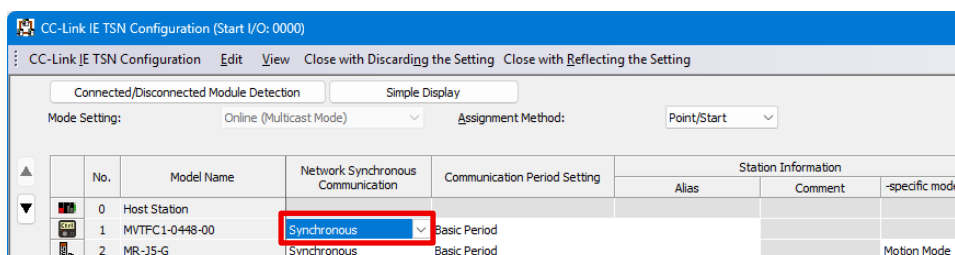


The CC-Link IE TSN configuration window appears.

2. In the module list, select [CC-Link IE TSN Module (ViSCO Technologies Corporation)] → [LED Lighting Controller] → [MVTF1-0448-00], and then drag and drop it to the station list or the network configuration diagram.



3. Set "Network Synchronous Communication" of the added lighting controller to "Synchronous".



**CAUTION**

If there are any devices to synchronize with the lighting controller other than the MELSEC MX Controller, set "Network Synchronous Communication" of the devices to "Synchronous".

4. Set the start number, IP address, or other items of the link devices (RX, RY, RWr, RWw) according to the system.

No.	Model Name	STAF	Station Type	Network Label	RX Setting			RY Setting			RW Setting			IP Address	Subnet Mask	Default Gateway	Reserved/Error Invalid Station	Network Synchronous Communication	Communication Period Setting
					Points	Start	End	Points	Start	End	Points	Start	End						
0	Host Station	0	Master Station	<input checked="" type="checkbox"/>									192.168.3.253				No Setting	Synchronous	Basic Period
1	MVTF1-01H-00	1	Remote Station	<input checked="" type="checkbox"/>	32	0000	002F	32	0000	002F	36	0038	002F	192.168.3.1			No Setting	Synchronous	Basic Period
2	MR-35-G	2	Remote Station	<input checked="" type="checkbox"/>							24	0000	002F	192.168.3.111			No Setting	Synchronous	Basic Period

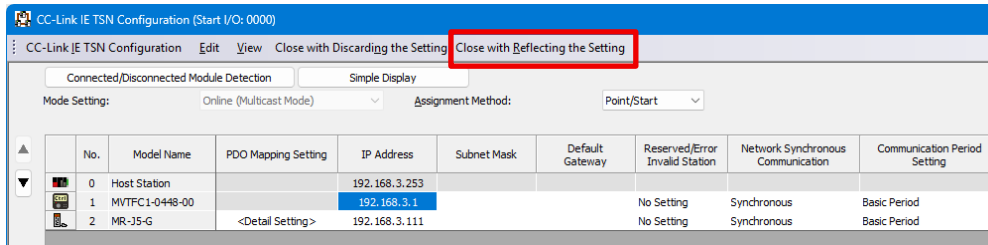
**TIPS**

- Set the IP address of the lighting controller to the same value as the one specified in "4.7 Device Connection Setting".
- If the start number setting for link devices is not displayed, click the [Detailed Display] button to display it.

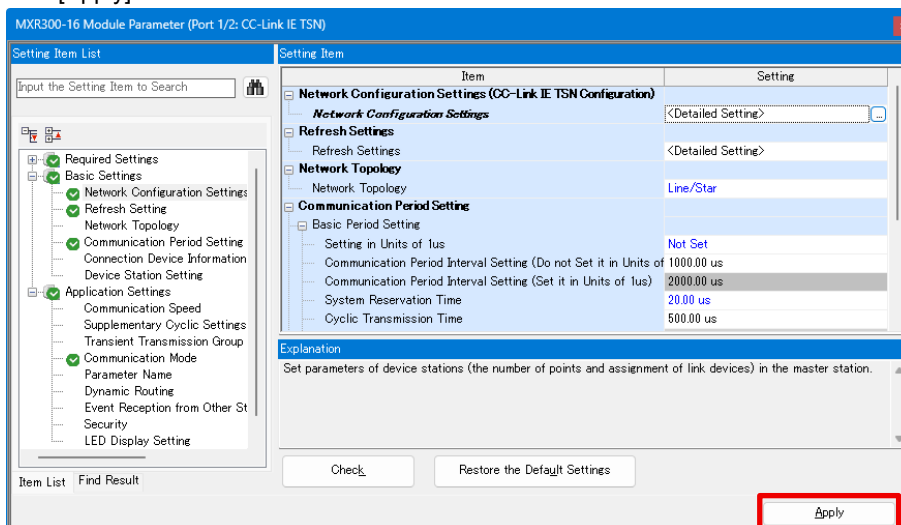
**CAUTION**

Make sure that the "Network Label" check box of the lighting controller is selected. (It is selected by default.)

5. Click the [Close with Reflecting the Setting] button.



6. Click the [Apply] button.



**CAUTION**

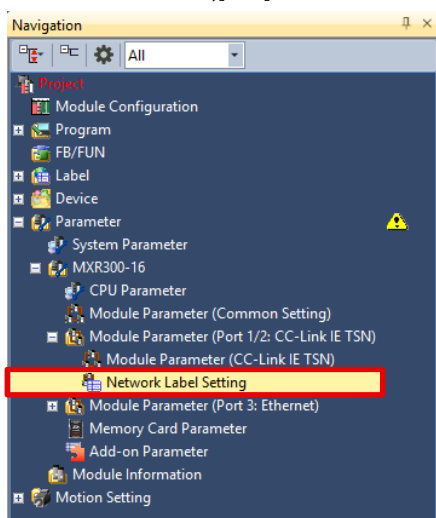
If a switching HUB is added to the system configuration when this solution is introduced, set [TSN HUB Setting] displayed by selecting [Basic Settings] → [Connection Device Information] to "Use TSN HUB" before performing Step 6.

For details, refer to the manual of each MELSEC MX Controller.

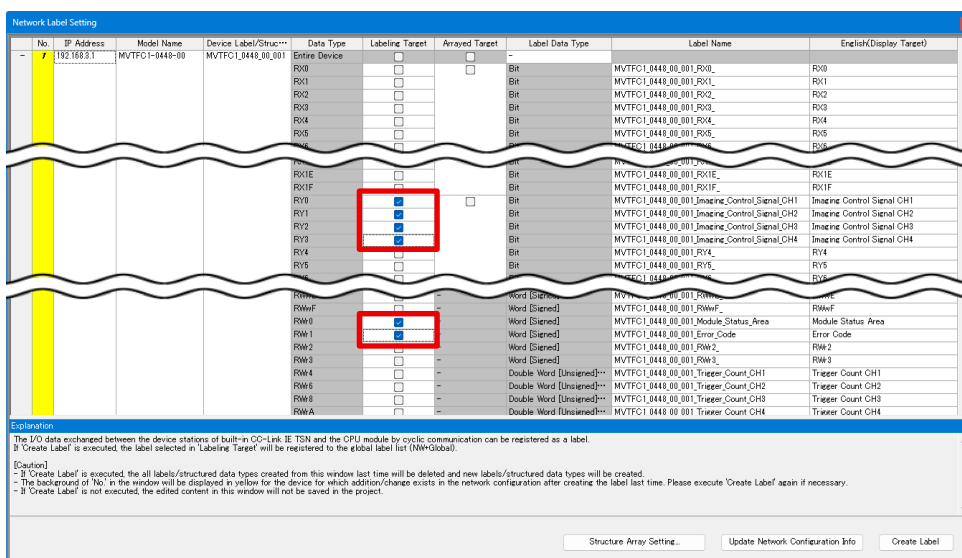
(3) Network label setting

To create a program for controlling the CH□ imaging control signals (RYn0 to RYn3), label each remote device of the lighting controller.

1. In the Navigation window, double-click [Parameter] → [(Model name of the MELSEC MX Controller)] → [Module Parameter (Port 1/2: CC-Link IE TSN)] → [Network Label Setting].



2. Select the labeling target check boxes of the following data types of the lighting controller "MVTF1-0448-00".



Data type	Description	Created label*1
RYn0	CH1 imaging control signal	MVTF1_0448_00_001_Imaging_Control_Signal_CH1
RYn1	CH2 imaging control signal	MVTF1_0448_00_001_Imaging_Control_Signal_CH2
RYn2	CH3 imaging control signal	MVTF1_0448_00_001_Imaging_Control_Signal_CH3

Data type	Description	Created label*1
RYn3	CH4 imaging control signal	MVFC1_0448_00_001_Imaging_Control_Signal_CH4
RWrn0	Module status area	MVFC1_0448_00_001_Module_Status_Area
RWrn1	Error code	MVFC1_0448_00_001_Error_Code

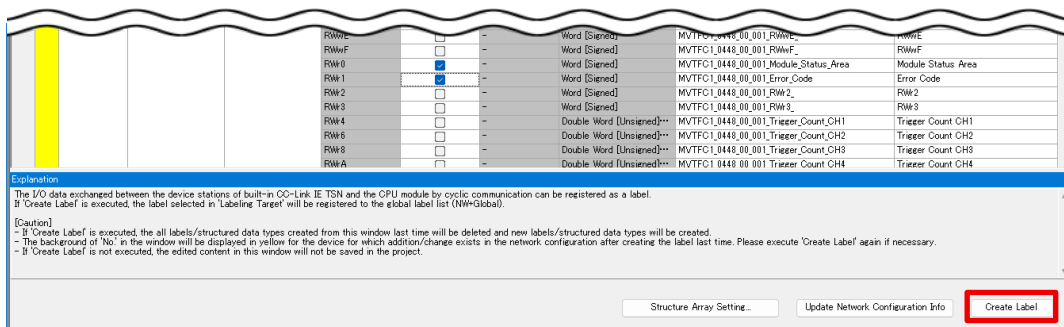
\*1: The names of the created labels differ depending on the setting. The names listed in this table are examples of the default setting.

 TIPS

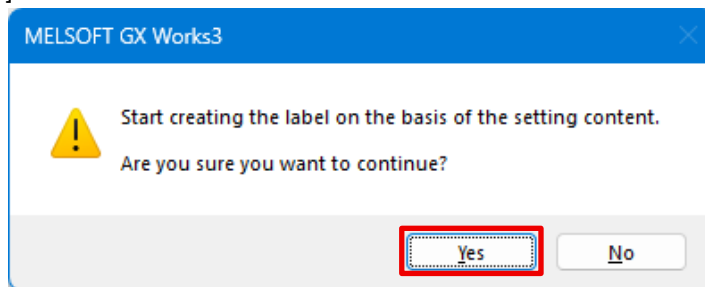
In the example shown in this guide, the following remote devices are labeled: RYn0 to RYn3 and RWrn0 which are required for creating the imaging control program and RWrn1 which indicates the error code of the lighting controller.

For details on each remote device of the lighting controller, refer to the manual of the lighting controller.

3. Click the [Create Label] button.



4. Click the [Yes] button.



The global labels of the remote devices selected in Step 2 are created in [Label] → [Global Label] → [NW+Global1] in the Navigation window.

(4) Creating the imaging control program

Create the imaging control program for controlling the CH□ imaging control signals (RYn0 to RYn3).

■Setting the fixed scan interval

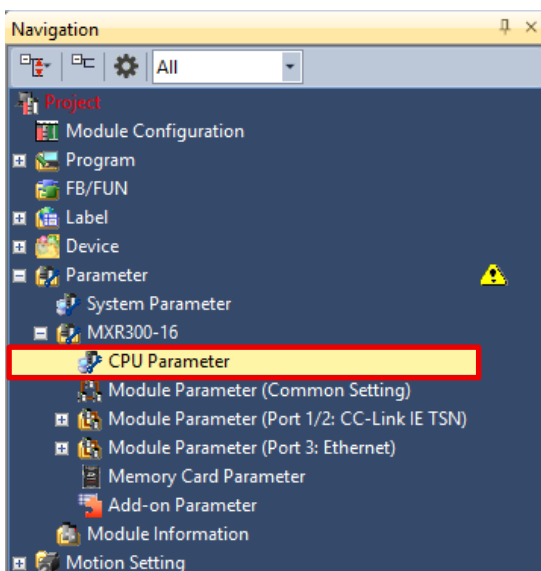
Code of the imaging control program must be written in a periodic execution type program. The execution cycle of the program must match the communication cycle interval of the MELSEC MX Controller.

The following describes the procedure for setting the fixed scan interval of the periodic execution type program.

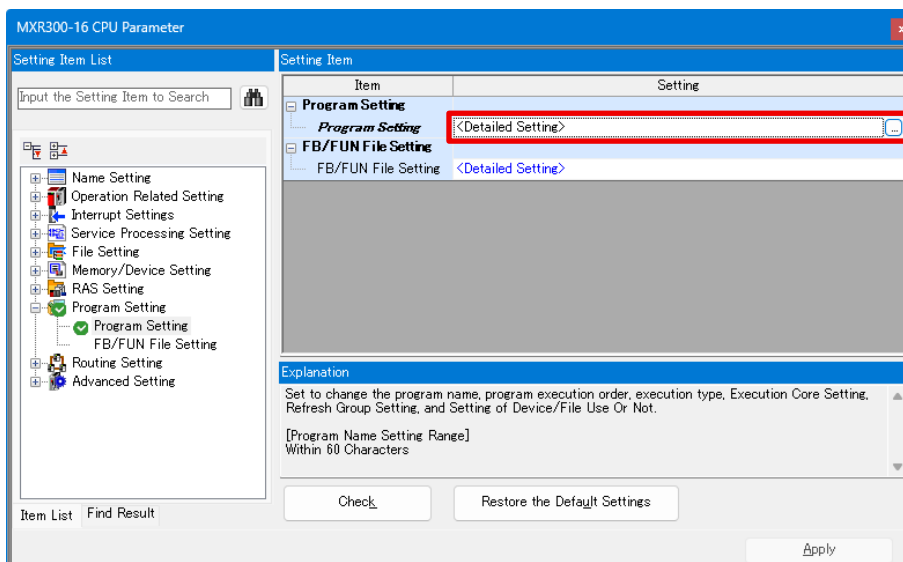
**CAUTION**

If the corresponding periodic execution type program does not exist in the existing project, create a new periodic execution type program. For creating a new periodic execution type program, refer to "GX Works3 Operating Manual".

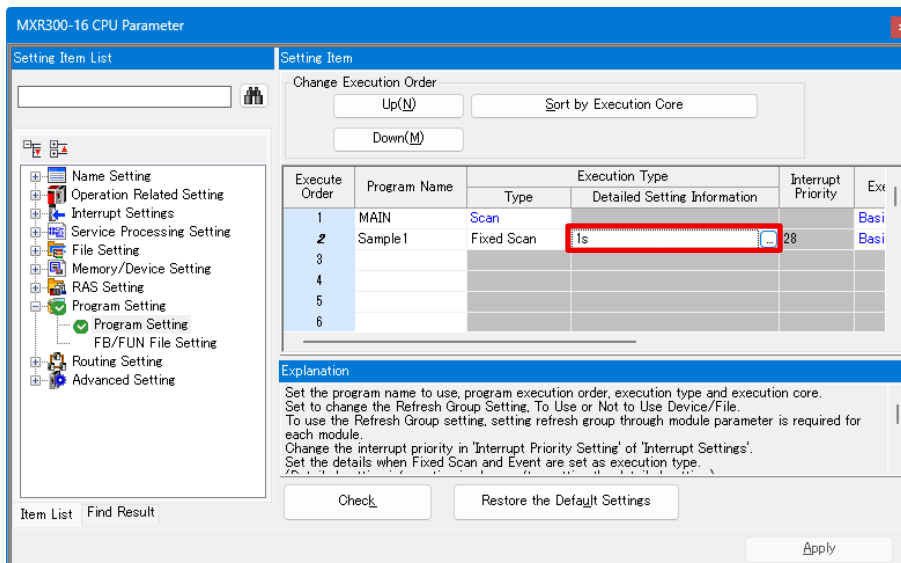
1. In the Navigation window, double-click [Parameter] → [(Model name of the MELSEC MX Controller)] → [CPU Parameter].



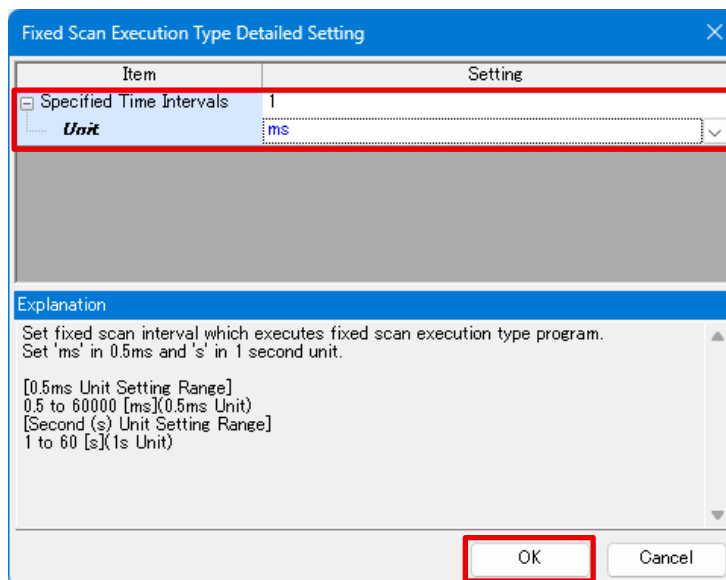
2. Click [Program Setting] in the setting item list, and then double-click "<Detailed Setting>" of [Program Setting] under [Program Setting] in the setting item.



3. Double-click "Detailed Setting Information" of the program to be used for the imaging control.



4. Set the "Specified Time Intervals" to the same value as the communication cycle interval of the MELSEC MX Controller, and then click the [OK] button.

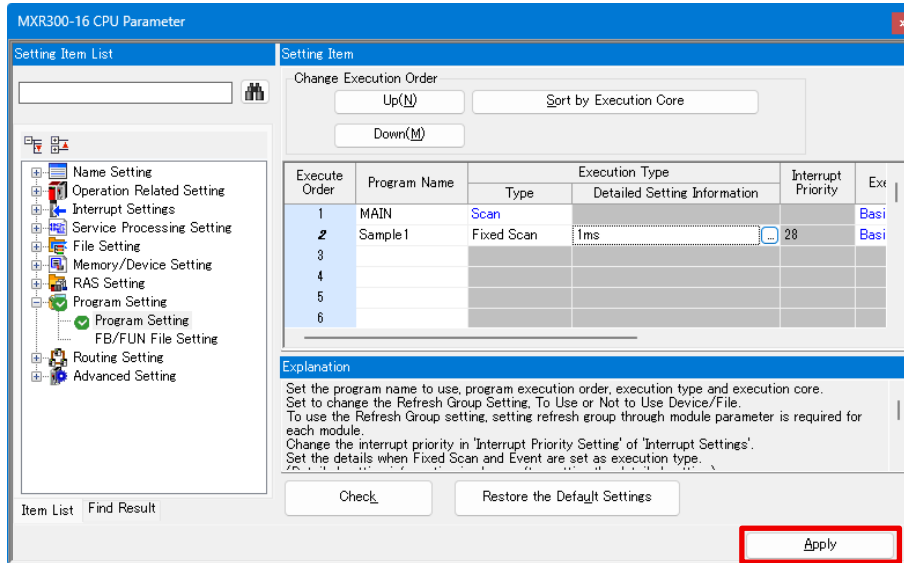


**TIPS**

The communication cycle interval of the MELSEC MX Controller can be checked by following the steps below.

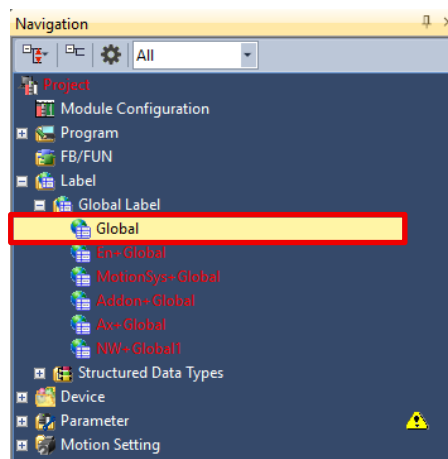
1. In the Navigation window, double-click [Parameter] → [(Model name of the MELSEC MX Controller)] → [Module Parameter (Port 1/2: CC-Link IE TSN)] → [Module Parameter (CC-Link IE TSN)].
2. Check the communication cycle interval set in [Communication Period Interval Setting (Do not Set it in Units of 1us)] or [Communication Period Interval Setting (Set it in Units of 1us)] under [Basic Period Setting] displayed by selecting [Basic Settings] → [Communication Period Setting].

5. Click the [Apply] button.



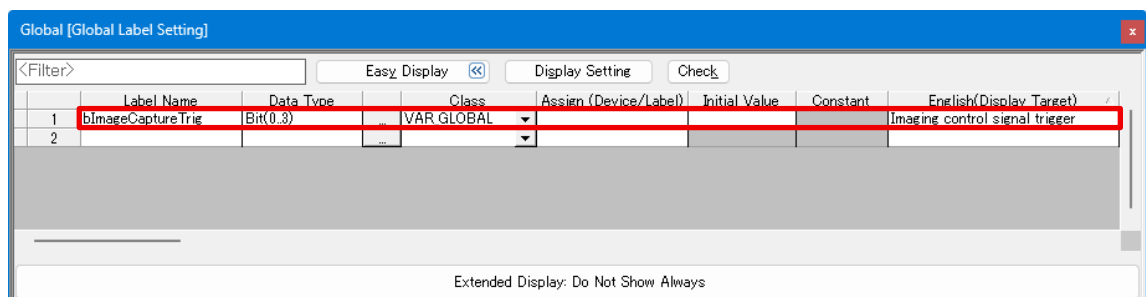
■ Writing code of the imaging control program

1. In the Navigation window, double click [Label] → [Global Label] → [Global].



2. Create the following global label to be used as the trigger of the imaging control.

- Label name: bImageCaptureTrig
- Data type: Bit (0..3)
- Class: VAR\_GLOBAL



3. Open the program to be used from [Program] → [Fixed Scan] in the Navigation window, and then write the following code.

```

1  /* Turn on bImageCaptureTrig [0] to [3] to start imaging. */
2
3
4
5
6
7  IF MYTFC1_0448_00_001_Module_Status_Area.1 THEN
8  /* When the trigger Ready is ON, set CH□ imaging control signal (RYn0 to RYn3). */
9  MYTFC1_0448_00_001_Imaging_Control_Signal_CH1 := bImageCaptureTrig[0] ;
10 MYTFC1_0448_00_001_Imaging_Control_Signal_CH2 := bImageCaptureTrig[1] ;
11 MYTFC1_0448_00_001_Imaging_Control_Signal_CH3 := bImageCaptureTrig[2] ;
12 MYTFC1_0448_00_001_Imaging_Control_Signal_CH4 := bImageCaptureTrig[3] ;
13
14 ELSE
15 /* When the trigger Ready is OFF, set CH□ imaging control signal (RYn0 to RYn3) to OFF. */
16 MYTFC1_0448_00_001_Imaging_Control_Signal_CH1 := FALSE ;
17 MYTFC1_0448_00_001_Imaging_Control_Signal_CH2 := FALSE ;
18 MYTFC1_0448_00_001_Imaging_Control_Signal_CH3 := FALSE ;
19 MYTFC1_0448_00_001_Imaging_Control_Signal_CH4 := FALSE ;
20 END_IF;
21

```

No.	Process description
(1)	Turn on the imaging control signal trigger "bImageCaptureTrig" to perform imaging. Write the desired timing.
(2)	When the trigger Ready (b1) of the module status area (RWrm0) of the lighting controller is ON, set the imaging control signal trigger "bImageCaptureTrig" for the CH□ imaging control signals (RYn0 to RYn3).
(3)	When the trigger Ready (b1) of the module condition area (RWrm0) of the lighting controller is OFF, turn off the CH□ imaging control signals (RYn0 to RYn3).

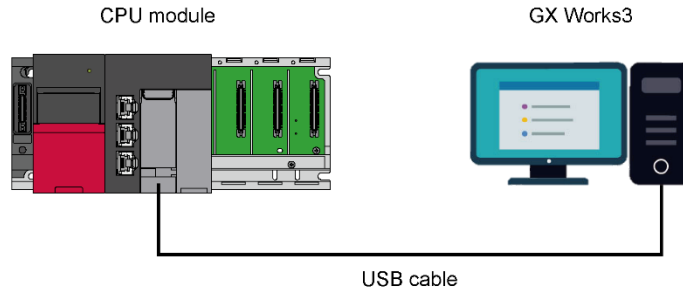
**CAUTION**

Interruptions must be enabled by the EI instruction to execute the imaging control program in a periodic execution type program. Add the process to execute the EI instruction to a program other than the imaging control program.

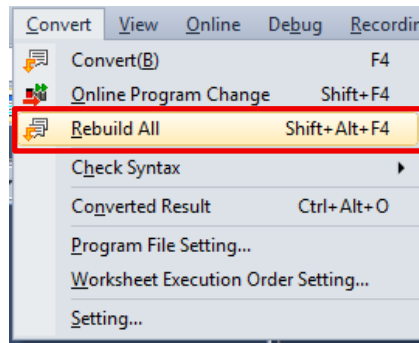
(5) Writing to the controller

Write the configured settings to the controller.

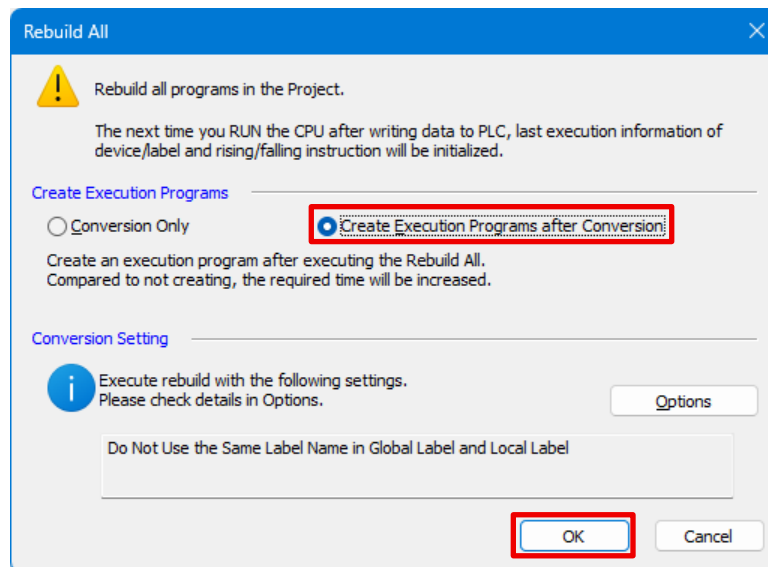
1. Connect the CPU module to GX Works3 with a USB cable.



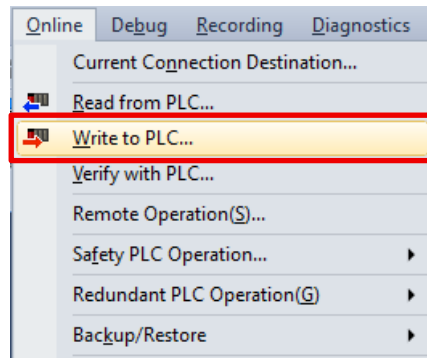
2. In the menu, click [Convert] → [Rebuild All].



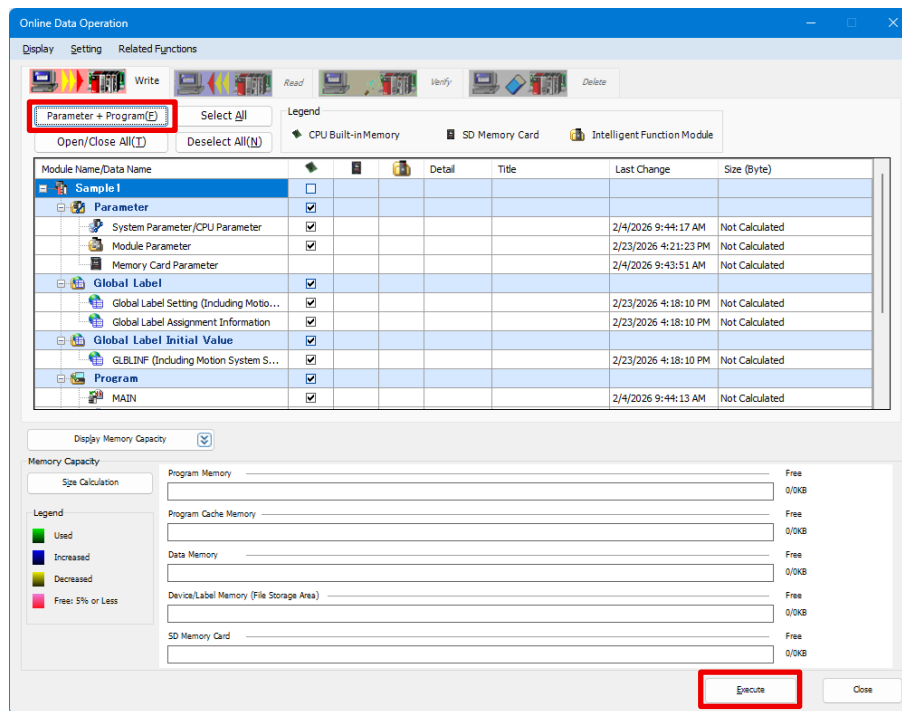
3. Select "Create Execution Programs after Conversion", and then click the [OK] button. All the programs will be rebuilt.



- Click [Online] → [Write to PLC] in the menu.



- Click the [Parameter + Program] button, and then click the [Execute] button.



The data will be written.

- After the data is written, reset the CPU module and change the status from STOP to RUN.

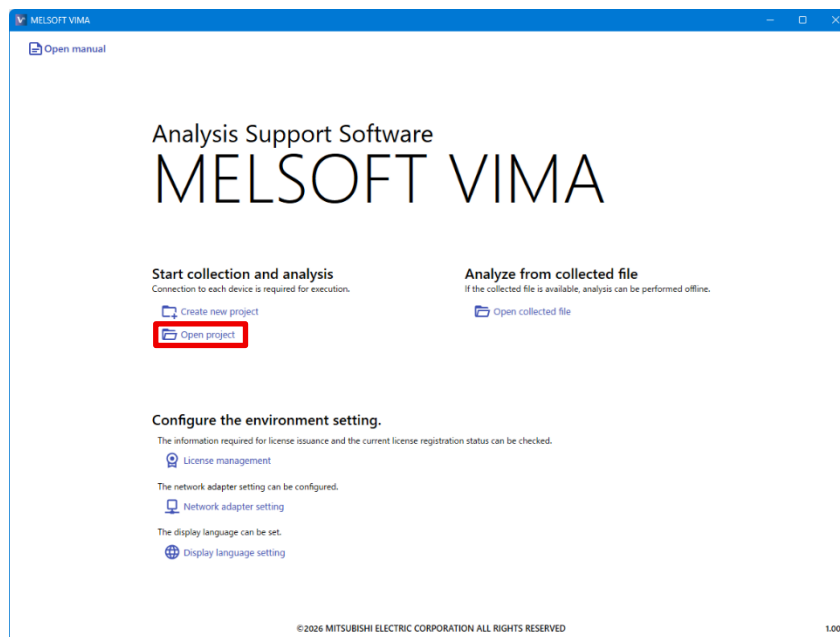
## 4.11.Final Adjustment of Imaging Environment

Perform the final adjustments of the imaging environment and check whether imaging can be performed at the desired timing and whether there are any issues with the image.

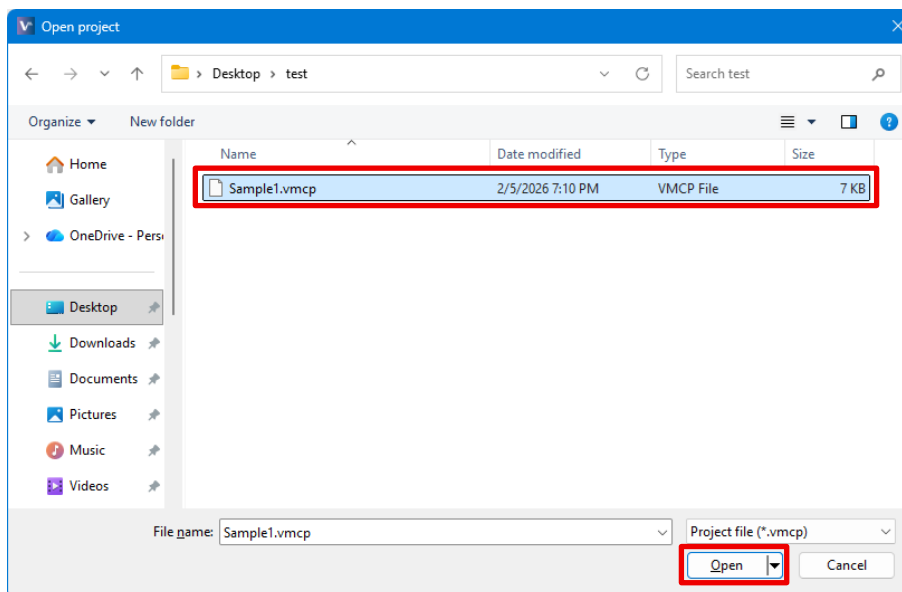
### 4.11.1. Reading a project

Start MELSOFT VIMA and open a saved project.

1. Start MELSOFT VIMA.
2. On the top screen, click "Start collection and analysis" → "Open project".



3. Select a project file (.vmcp) and click the [Open] button.

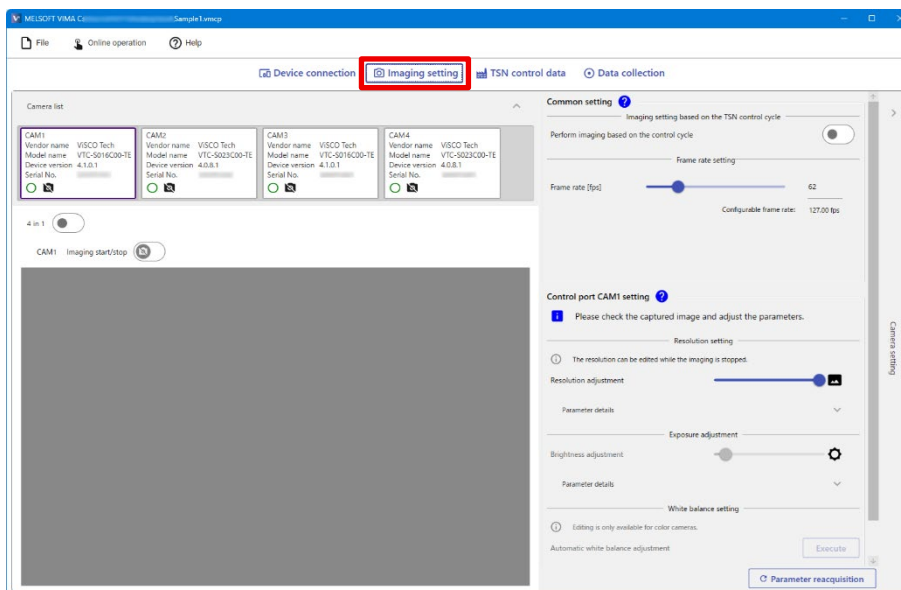




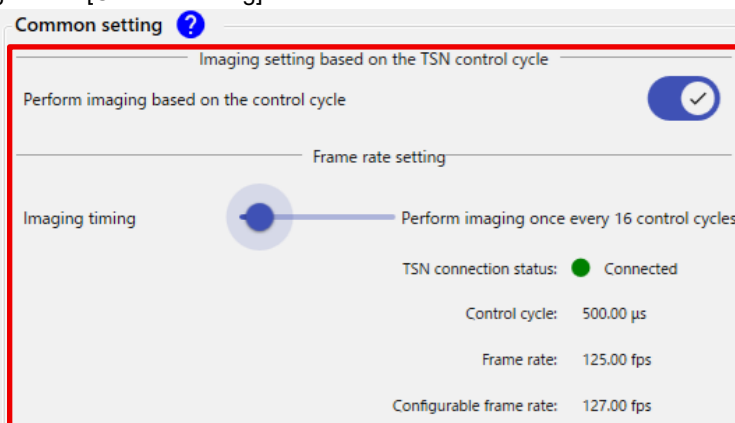
### 4.11.2. Setting the frame rate

Configure settings for controlling imaging of each camera with the master station.

1. Click the [Imaging setting] button.



2. Set "Common setting" of the [Camera setting] window as follows.



Item	Description	
Imaging setting based on the TSN control cycle	Perform imaging based on the control cycle	Set to ON.
Frame rate setting	Imaging timing [Perform imaging once every n control cycles]	Set the number of TSN control cycles for each imaging to the desired value. "Frame rate" is calculated based on this setting.

#### ⚠ CAUTION

If a state other than "Connected" is displayed in "TSN connection status", MELSOFT VIMA is not properly communicating with the devices via CC-Link IE TSN; as a result, imaging based on the control cycle cannot be started.

For troubleshooting when a state other than "Connected" is displayed, refer to "Critical Moments Analytics Solution User's Manual".

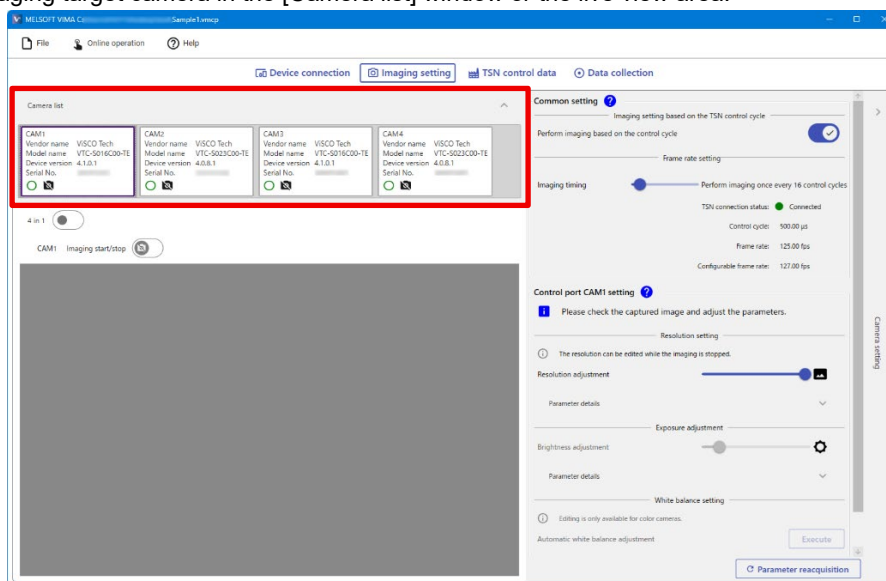
**TIPS**

The value displayed in "Configurable frame rate" indicates the maximum frame rate that can currently be set. If the "Configurable frame rate" is lower than the desired frame rate, adjusting the resolution using the procedure described in "4.8.2(1) Adjusting the resolution" can increase the "Configurable frame rate".

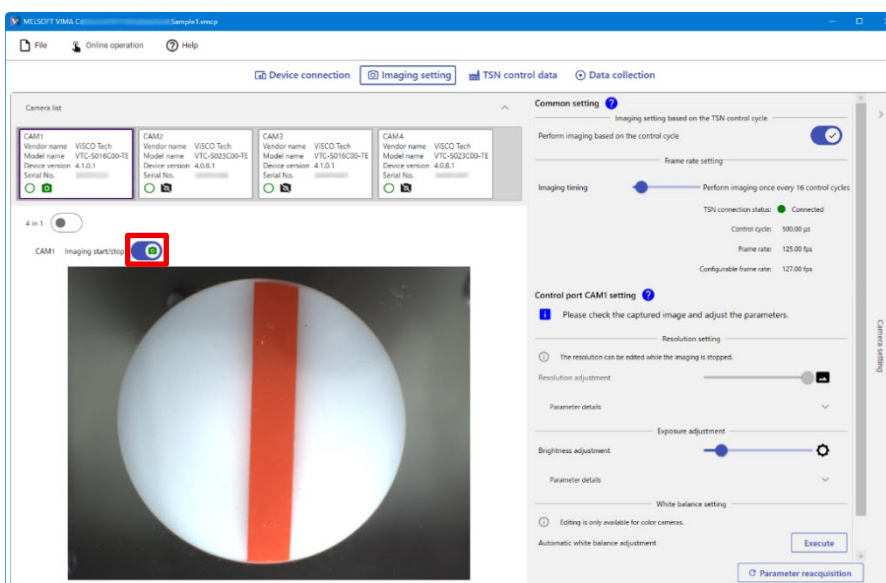
### 4.11.3. Checking the camera images

Start imaging for each camera and check the camera image during solution operation.

1. Select the imaging target camera in the [Camera list] window or the live view area.



2. When the imaging control signal triggers "bImageCaptureTrig[0] to [3]" for the target camera turn on, click the [Imaging start/stop] button to turn it on. Imaging starts. Check that there are no problems with the camera image.



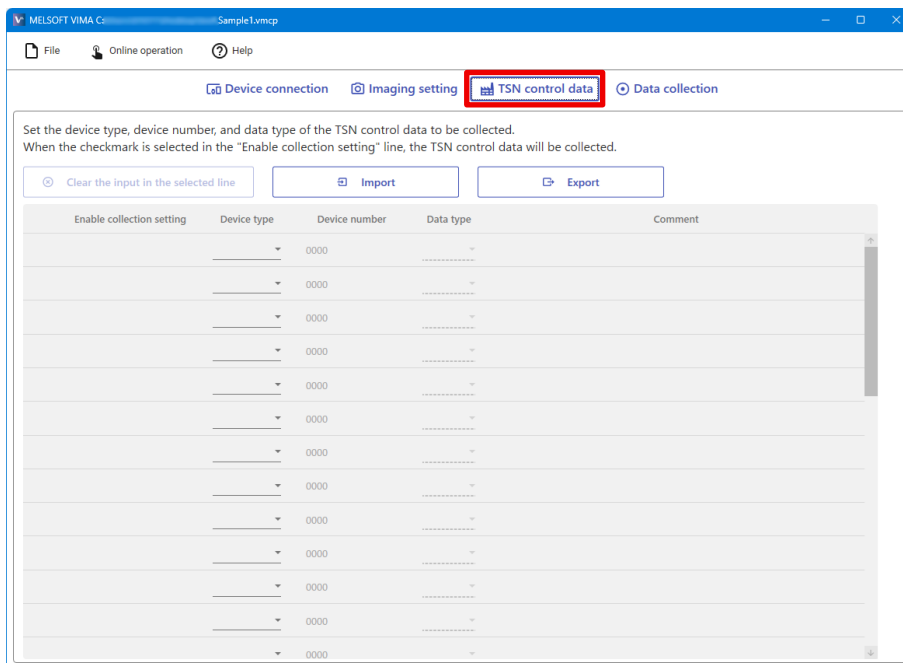
**CAUTION**

- When the imaging control signal triggers "bImageCaptureTrig[0] to [3]" for the target camera turn off during imaging, an imaging error occurs, and update of the camera image stops.  
 When the imaging control signal triggers "bImageCaptureTrig[0] to [3]" turn on again, imaging resumes. (The imaging error will be cleared.)
- If there is a problem with the camera images, or if the control port settings could not be written to the lighting controller in "4.11.1 Reading a project", perform "4.8.2 Adjusting the camera and lighting" again.

## 4.12.TSN Control Data Collection Setting

In MELSOFT VIMA, configure the settings of the TSN control data to be collected.

1. Click the [TSN control data] button.



2. Set the following items according to the data to be collected.

Enable collection setting	Device type	Device number	Data type	Comment
<input checked="" type="checkbox"/>	RWw	0000	Word	Sample1
<input checked="" type="checkbox"/>	RWw	000A	Word	Sample2
<input checked="" type="checkbox"/>	RWw	000B	Word	Sample3

Item	Description
Device type	Select the device type of the data to be collected.
Device number	Enter the device number (hexadecimal number) of the data to be collected.
Data type	Set the data type of the data to be collected.
Comment	Enter the comment for the data to be collected. (Optional) The set comments can be displayed in the graph legend.

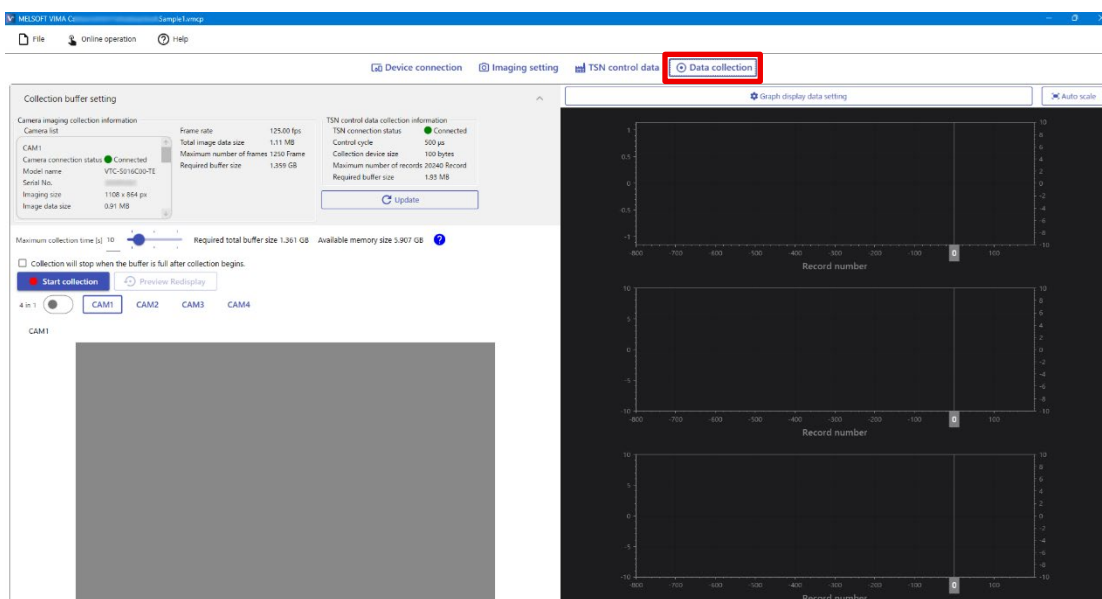
## 4.13. Execution of Data Collection

Perform data collection, and then check and save the collected data.

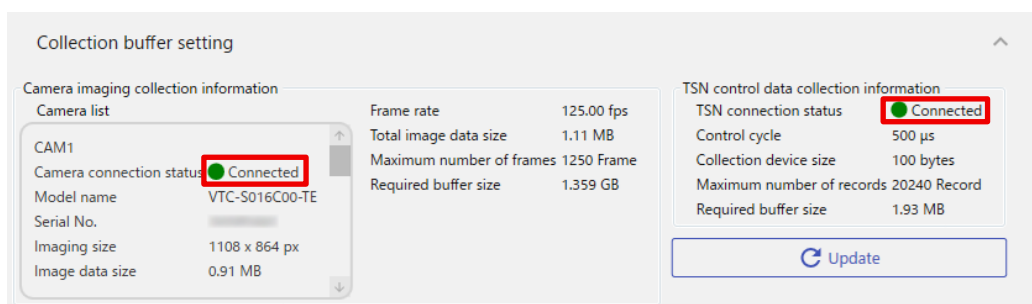
### 4.13.1. Setting before starting data collection

Before starting data collection, set the maximum collection time and the data to be displayed in the graph during collection.

1. Click the [Data collection] button.



2. In the [Collection buffer setting] window, check that the following items are "Connected".
  - "Camera imaging collection information" → "Camera list" → "Camera connection status" of all cameras
  - "TSN control data collection information" → "TSN connection status"

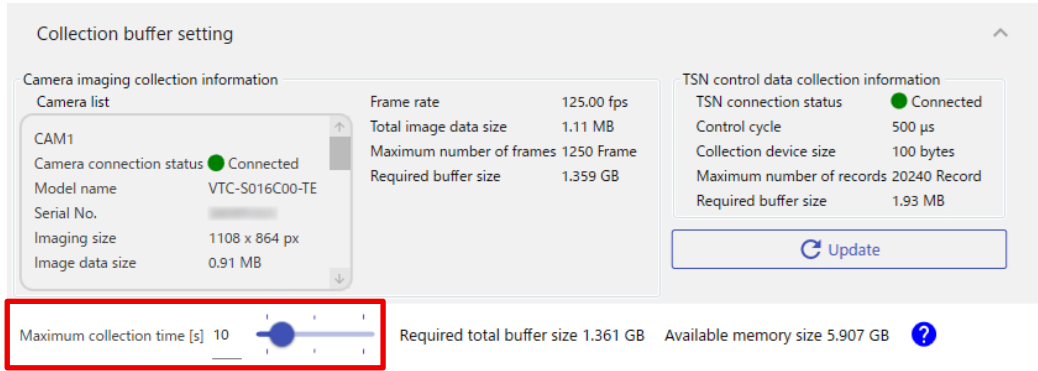


#### ⚠ CAUTION

If a state other than "Connected" is displayed, the correct buffer size will not be calculated and the collection will not be started.

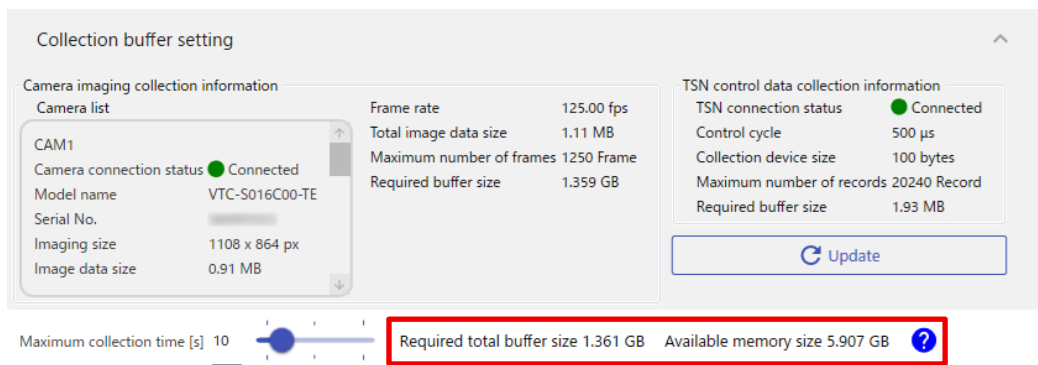
For troubleshooting when a state other than "Connected" is displayed, refer to "Critical Moments Analytics Solution User's Manual".

3. Set "Maximum collection time [s]" to the desired value.

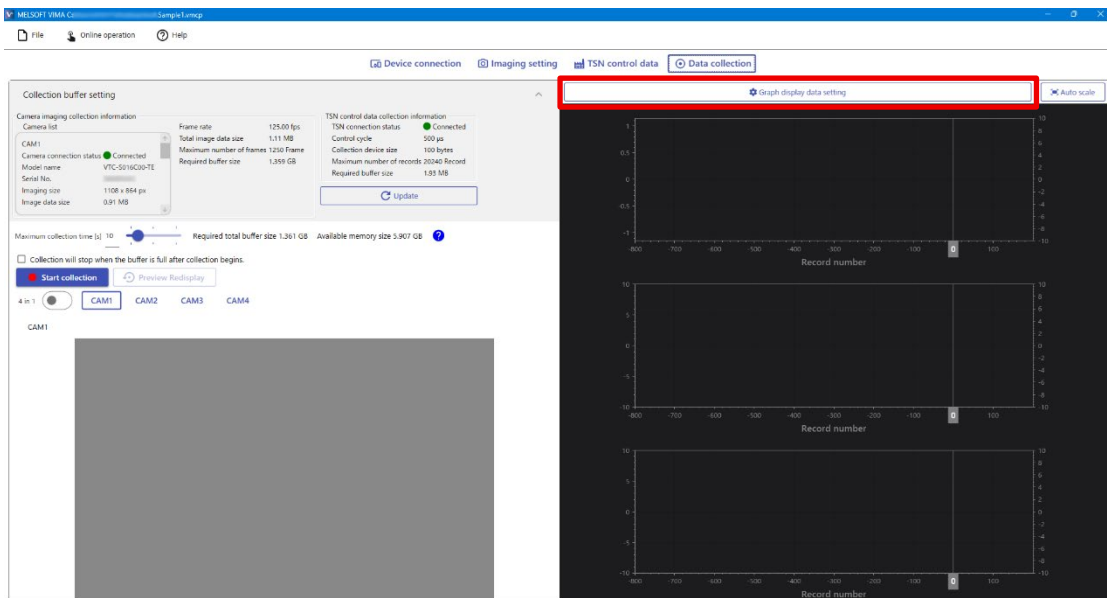


The value of "Required total buffer size" is updated according to the setting value.

Compare "Required total buffer size" with the available memory size, and confirm that the data size is within the collectable range.

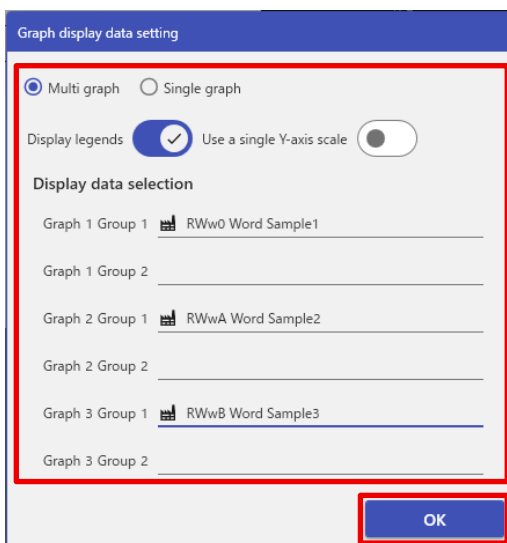


4. To change the display format of the TSN control data and graph to be displayed during collection, click the [Graph display data setting] button.



5. The graph display data setting will be displayed.

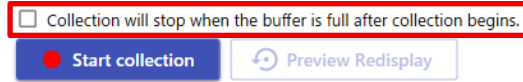
Set the display format or the TSN control data to be displayed according to your preferences, and then click the [OK] button.



### 4.13.2. Starting the data collection

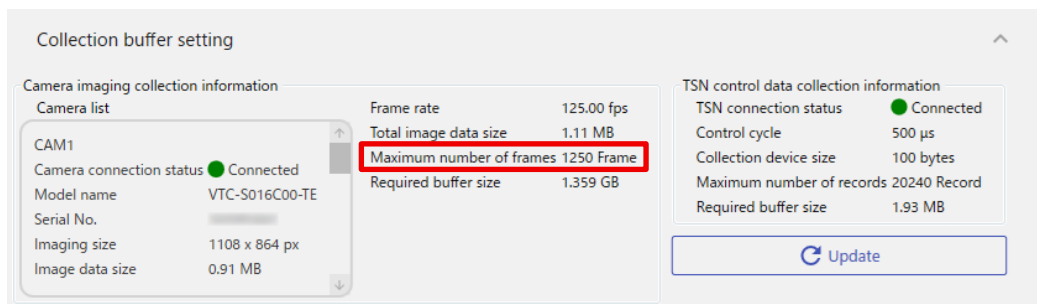
Start the data collection with the configured imaging environment and collection settings, and check the collected data.

1. Select "Collection will stop when the buffer is full after collection begins." depending on the condition for stopping collection.

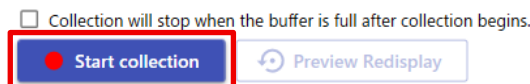


Condition for stopping collection	Description
When automatically stopping the collection after the data for "Maximum number of frames" <sup>*1</sup> is collected	Select "Collection will stop when the buffer is full after collection begins."
When manually stopping the collection (The latest data for "Maximum number of frames" <sup>*1</sup> at the time of stopping will be collected.)	Deselect "Collection will stop when the buffer is full after collection begins."

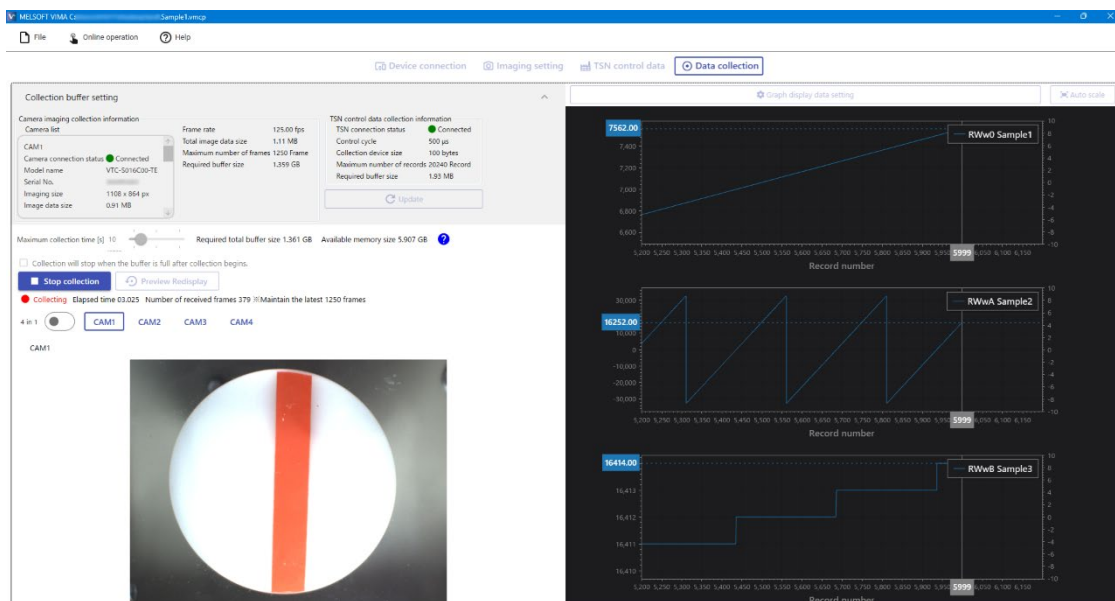
\*1: "Maximum number of frames" can be checked in the [Collection buffer setting] window.



2. When the imaging control signal triggers "bImageCaptureTrig[0] to [3]" for the collection target turn on, click the [Stop collection] button.



Collection starts, and the imaging data and the TSN control data currently being collected are displayed.



**TIPS**

The display of the imaging data currently being collected can be switched using the following methods.

- Clicking the [CAM1] button to [CAM4] button displays the corresponding imaging data.
- Clicking the [4 in 1] button displays all imaging data.

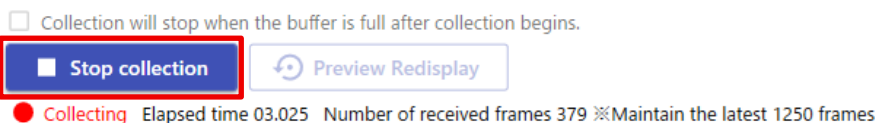
**CAUTION**

- To perform the collection, the imaging control signal triggers "blmageCaptureTrig[0] to [3]" for all the collection target cameras must be ON.
- If the imaging control signal triggers "blmageCaptureTrig[0] to [3]" for the collection target turn off during collection, the collection fails. To restart the collection, confirm that the imaging control signal triggers "blmageCaptureTrig[0] to [3]" have turned on, and then click the [Start collection] button.
- If the collection exceeding the available memory size is performed, data missing may occur or collection may fail.

3. Depending on the selection status of "Collection will stop when the buffer is full after collection begins.", the collection will be stopped manually or automatically.

- When "Collection will stop when the buffer is full after collection begins." is not selected

Click the [Stop collection] button. The collection stops and the collected result preview appears. (The latest data for "Maximum number of frames" at the time of stopping will be collected.)

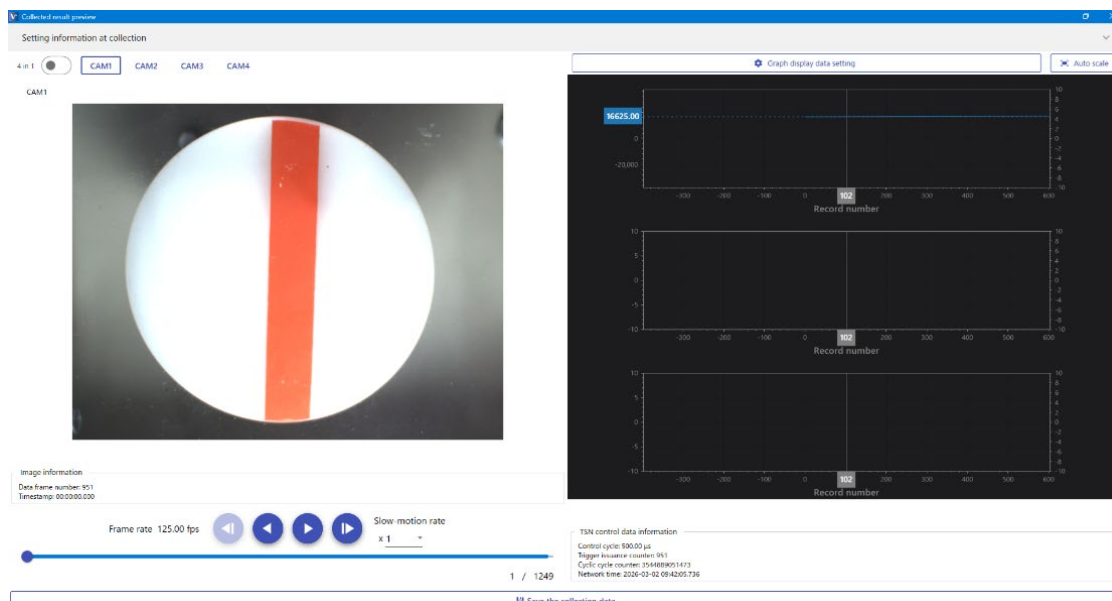


- When "Collection will stop when the buffer is full after collection begins." is selected

The collection automatically stops when the data for "Maximum number of frames" is collected, and the collected result preview appears.

4. Check the collected results displayed in the collected result preview.

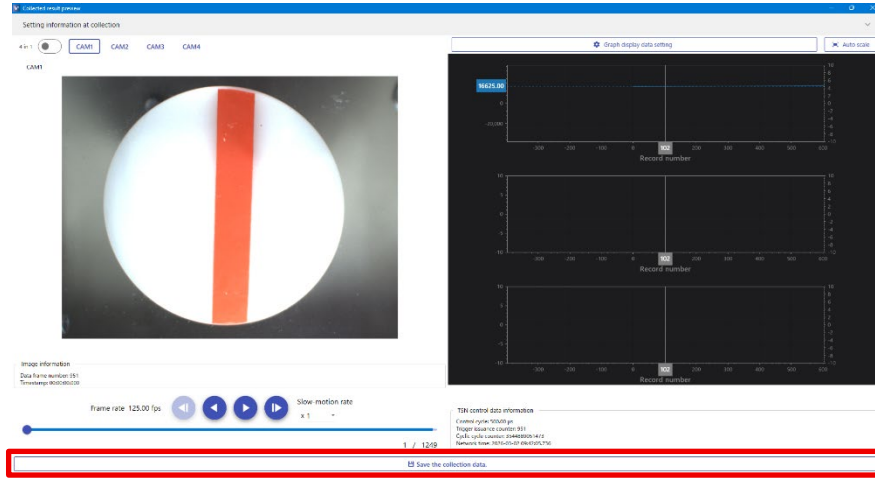
When the desired data cannot be obtained, close the collected result preview and execute the collection again.



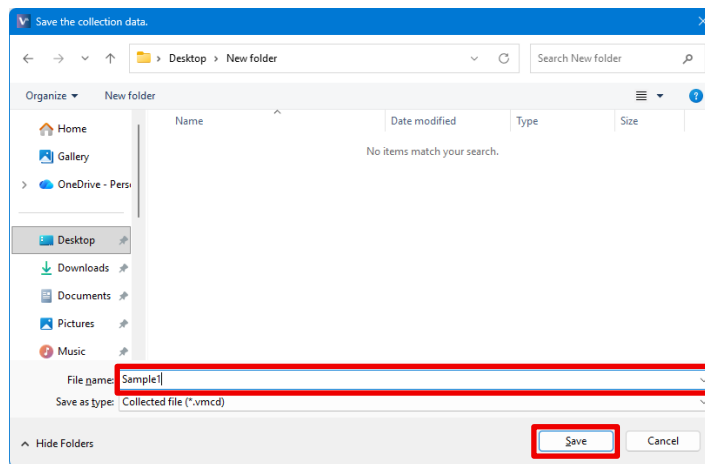
### 4.13.3. Saving of collection data

Save the collected data as a collected file.

1. Click the [Save the collection data.] button on the collected result preview.



2. Set the desired save destination and file name and click the [Save] button.

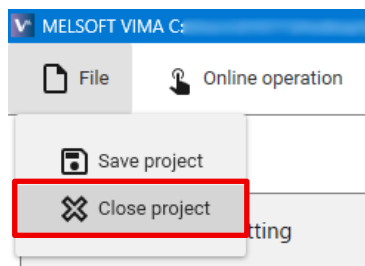


The collected file (.vmcd) will be saved. When the file has been saved, the message "The file has been saved." appears.

#### ⚠ CAUTION

If the size of the data to be saved is large, saving the data may take some time. Do not close MELSOFT VIMA while the data is being saved.

3. After the saving processing is completed, close the collected result preview.
4. In the menu, click [File] → [Close project] to close the project.



## 4.14. Post-Operation Procedure

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After completing the operation of the solution, follow the procedures below for the purpose of removing each device of the solution from the target equipment, deleting the settings, and others.

(1) Removing each device of the solution from the target device

Remove various devices such as the lighting controller and cameras, which were connected during introduction and operation of the solution, from the target equipment.

(2) Setting the communication mode of the master station to unicast mode

When the communication mode of the master station has been changed to the multicast mode, reset it to the unicast mode.

■When the master station is a Motion module

Change the communication mode of the Motion module set in "4.10.1(1) Communication mode setting" to the unicast mode.

■When the master station is a MELSEC MX Controller

Change the communication mode of the MELSEC MX Controller set in "4.10.2(1) Communication mode setting" to the unicast mode.

(3) Deleting the lighting controller from the network configuration

Delete the lighting controller added to the network configuration of the master station.

■When the master station is a Motion module

Delete the lighting controller added in "4.10.1(2) Network configuration setting (adding the lighting controller)" from the network configuration of the Motion module.

■When the master station is a MELSEC MX Controller

Delete the lighting controller added in "4.10.2(2) Network configuration setting (adding the lighting controller)" from the network configuration of the MELSEC MX Controller.

(4) Deleting the global labels of the lighting controller

Delete the global labels of the remote devices of the lighting controller.

■When the master station is a Motion module

Remove the remote devices of the lighting controller labeled in "4.10.1(3) Network I/O setting" from the labeling targets in the network label setting, and then perform the label creation again.

The global labels of the remote devices of the lighting controller will be deleted.

**⚠CAUTION**

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- If only the remote devices of the lighting controller are labeled in the network I/O setting, the label creation cannot be executed. Manually delete the global label list "NW+Global1".
  - When code of the imaging control program is written in the sequence program, apply the public labels again after deleting the global labels of the remote devices of the lighting controller.
- 

■When the master station is a MELSEC MX Controller

Remove the remote devices of the lighting controller labeled in "4.10.2(3) Network label setting" from the labeling targets in the network label setting, and then perform the label creation again.

The global labels of the remote devices of the lighting controller will be deleted.

(5) Deleting the imaging control program

Delete the imaging control program written in the master station.

■When the master station is a Motion module

Delete the imaging control program written in "4.10.1(4) Creating the imaging control program". Delete the global label "bImageCaptureTrig" created as the trigger of the imaging control.

■When the master station is a MELSEC MX Controller

Delete the imaging control program written in "4.10.2(4) Creating the imaging control program". Delete the global label "bImageCaptureTrig" created as the trigger of the imaging control.

## 4.15. Troubleshooting by Symptom

This section describes the troubleshooting by symptom of issues encountered during the introduction procedure of MELSOFT VIMA.

### 4.15.1. Unable to obtain or register a license

No.	Symptom	Action
1	The hardware code required to obtain the license file is not displayed.	MELSOFT VIMA cannot be used on your personal computer. Install MELSOFT VIMA to a personal computer that satisfies the operating environment described in "3.3.1 Operating environment".
2	The license cannot be registered.	<ul style="list-style-type: none"> <li>• A file other than the MELSOFT VIMA license file or a license file with an altered file name or contents may have been selected. Use the correct license file.</li> <li>• A license key file created using the hardware code of another personal computer may have been selected. Check the registered license file and hardware code are correct. The hardware code of the license file can be checked with the file name of the license key file.</li> </ul>

### 4.15.2. Unable to set the network adapter

No.	Symptom	Action
1	The network adapter to be used is not displayed as a selectable item.	<ul style="list-style-type: none"> <li>• There may be no network adapter that is compatible with MELSOFT VIMA on your personal computer. Change the personal computer to the one equipped with an available network adapter.</li> <li>• Check that the target network adapter is recognized properly on your personal computer. If the network adapter is not recognized properly, reinstall its driver to ensure that it is recognized properly.</li> <li>• If a new network adapter is added after MELSOFT VIMA starts, restart MELSOFT VIMA.</li> <li>• When using a USB-to-LAN adapter, check that it is compatible with USB 3.0. This solution may not function properly if a USB-to-LAN adapter that is not compatible with USB 3.0 is used. Replace it with the USB-to-LAN adapter that is compatible with USB 3.0.</li> </ul>
2	Application of the network adapter setting fails.	If the personal computer has not been restarted after installing MELSOFT VIMA, restart the personal computer.

No.	Symptom	Action
3	The IP address displayed when the network adapter is selected is different from the expected setting value.	<ul style="list-style-type: none"> <li>• The network adapter may not be connected to the network. If it is not connected to the network, an IP address may be automatically assigned and displayed in MELSOFT VIMA regardless of the network adapter setting. Review the connection of the network adapter to check that it is properly connected to the network, and then restart MELSOFT VIMA.</li> <li>• Multiple IP addresses may be set on the network adapter. If multiple IP addresses are set, the expected setting value will not be displayed and another IP address may be displayed. Check the name of the network adapter to be used, and set the correct IP address on it. If it does not operate correctly, set only one IP address on the network adapter.</li> </ul>



**TIPS**

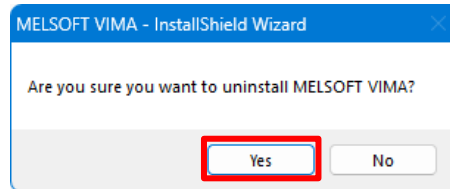
For issues other than the above or for troubleshooting problems occurring with each device, refer to the following.

- Critical Moments Analytics Solution User's Manual (Troubleshooting of devices that are added for MELSOFT VIMA and the solution)
- GX Works3 Operating Manual (Troubleshooting of GX Works3)
- User's manuals of programmable controllers (Troubleshooting of programmable controllers used in the solution)

## 5. UNINSTALLATION PROCEDURE OF MELSOFT VIMA

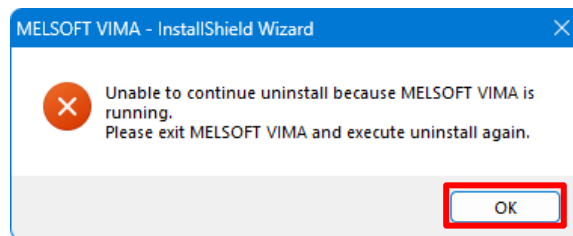
The following shows the uninstallation procedure of MELSOFT VIMA.

1. Double-click the MELSOFT VIMA installer "setup.exe".  
Or, select "MELSOFT VIMA" from the list in "Programs and Features" to perform uninstallation.
2. When the uninstallation confirmation dialog box appears, click the [Yes] button.

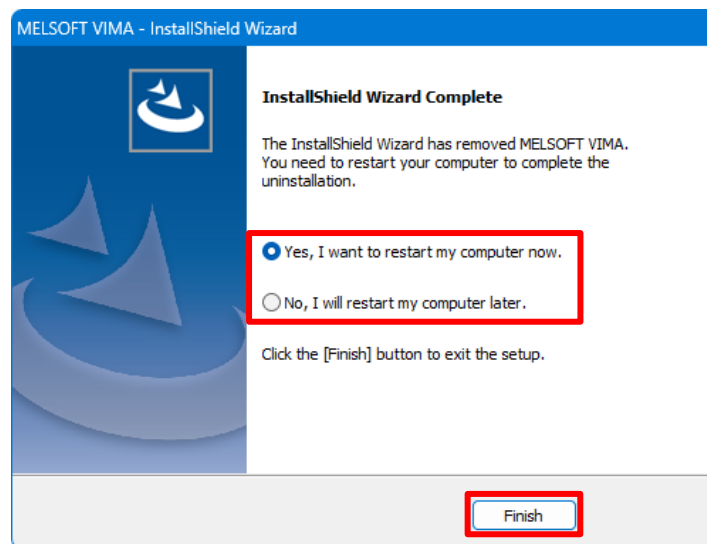


### CAUTION

The following dialog box appears when MELSOFT VIMA is running. Click the [OK] button to exit MELSOFT VIMA.



3. The following window appears when the uninstallation is complete.  
Select whether to restart the personal computer, and then click the [Finish] button.



4. When "Yes, I want to restart my computer now." is selected in Step 3, the personal computer automatically restarts.  
When "No, I will restart my computer later." is selected, restart the personal computer.

### CAUTION

Project files and collection files saved with MELSOFT VIMA are not deleted during uninstallation. Manage these files yourself and delete them when they are no longer needed or when disposing of the personal computer.

## App 1 Open-Source Software

MELSOFT VIMA consists of multiple software components. Our company or a third party holds copyright of each component.

Open-source software incorporated in MELSOFT VIMA and its conditions are listed in a file in the installation folder.

Example:

Location of the file when the standard installation folder is selected

- C:\Program Files\MELSOFT\VIMA\Doc\Licenses\

Our company's or other companies' software is not subject to source code distribution.

Please refrain from inquiries regarding the content of open-source software source code.

## REVISIONS

Revision date	No.	Description
April 2026	BCN-89796-0228-A	First edition

## INFORMATION AND SERVICES

For further information and services, please contact your local Mitsubishi Electric sales office or representative.  
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## COPYRIGHT

For the open-source software used in MELSOFT VIMA, refer to the "App 1 Open-Source Software".



TRANSLATION OF THE ORIGINAL INSTRUCTIONS

BCN-89796-0228-A(2604)

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